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Collections are invariably made directly from this office for subscriptions, advertisements, etc. We have agents to solicit the same, but they are not authorized to receipt for money.

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Indexes for the previous 6 months will be found in the First number of July and the First number of January.

Books.—We will forward by express, at publisher's lowest rates, any book—scientific or otherwise—to any address in the United States or Canada. We would suggest to our patrons that to avoid the risk and expense consequent on sending us the money (we do not send books C. O. D.), that orders for books be sent us through the Purchasing Department of the American Express Company.

The Public Lighting Tables of the American Meter Company will be found in the page advertisement of that Company.

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[OFFICIAL NOTICE.]

Wrinkle Department, American Gas Institute.

To the Members of the American Gas Institute: All members of the Institute are earnestly requested to send in as soon as possible contributions for this year's Wrinkle Department report. The success of the Department depends entirely on the co-operation and assistance of the members.

Mail all contributions to Milan R. Bump, Editor, No. 60 Wall street, New York city.

BRIEFLY TOLD.

MR. PARKINSON EXPLAINS.—The following letter respecting an article that appeared in our issue for June 15th, on "Undetachable Services," which subsequently came in for some criticism by Mr. Godfrey L. Cabot, seems to make the matter treated on appear in correct form:

RESTHOLME, LEIGHTON BUZZARD, ENGLAND, July 21, 1908.

To the Editors AMERICAN GAS LIGHT JOURNAL: Referring to my article in the English "Gas World," which you reproduced in your issue of June 15th, which is criticised in the interesting communication of Mr. Godfrey L. Cabot, in your issue of June 29th. My mention of the "Rigid" joint for steel mains has been apparently misunderstood by Mr. Cabot. I referred to a special joint, of the socket-and-spigot type, which is only rigid in a lateral sense, not longitudinally. As a matter of fact, every joint is an expansion joint. The spigot of the one pipe fits tightly into the other for some distance, while the actual caulking socket is only about 1½ inches long, and is, therefore, economical in both lead and labor. The joint has been extensively used over here and is known as the "Parkinson Rigid Joint." There is no patent attached to it. The same principles of lateral rigidity as I have advocated were brought out in a recent discussion in German gas circles. The possibilities of improved jointing with steel mains were there emphasized, although not carried to the full, logical issue.

I am, dear sirs, Yours faithfully, R. R. PARKINSON.

CURRENT MENTION.—

THE annual meeting of the Equitable Illuminating Gas Light Company will be held in Philadelphia at noon to-morrow.

AT the annual meeting of the Nashua (N. H.) Light, Heat and Power Company it was voted to extend the Company's distribution system across the Merrimac river to the hustling town of Hudson—a certainly wise move. The officers elected were: Directors, F. W. Estabrook, F. E. Anderson, J. H. Tolles, G. E. Anderson and Elbert Wheeler; President, F. W. Estabrook, Secretary, J. A. Tolles; Treasurer, Elbert Wheeler.

THE Geist properties in Pennsyvania have been purchased by the American Gas Company, of Philadelphia. They were heretofore operated under the title of the Wyoming Valley Gas and Electric Company. The Company controlled the lighting supply of th[illegible]

Nanticoke, Newport, Hanover, Kingston, Edwardsville, Luzerne, Forty-Fort, Dorranceton, Carlisle, Hazleton City, West Hazleton and Hunle, all in Pennsylvania. The main offices of the concern are located in Plymouth.

MR. JOHN C. STRUSS has been appointed City Gas Inspector for Louisville, Ky.

TOWARDS the close of July a numerously signed petition was presented to the authorities of Indianapolis by the residents of the Irvington section of that city. The burden of the prayer was that gas arc lamps be substituted for the arc electric lights now, and for some time back, used for the illuminating of roadways. The recital was also made that on account of the winding nature of the streets in the Irvington division gas arcs could be placed much closer together than arc electric lamps, both on the score of more effective lighting and outside the pale of prohibitive cost. The signers, too, were representative property holders of the district in which the change is sought. The petition made no mention whatever of the availability of electric incandescent lamps.

AT the annual meeting of the Northampton (Mass.) Gas Company the officers' reports show that business gains had been made all round in its trading, and that a goodly sum had been expended in plant improvement. A complete, new purifying system is being constructed, the plan for it adopted involving a considerable extension to the buildings. The electric division of its plant is to be improved, it having been determined to put in a generator, the capacity of which will enable the Company to double its output of current. A semi-annual dividend of 3 per cent. was declared, payable on demand, and the officers elected were: Directors, H. L. Clark, Jno. N. Lyman, G. L. Manchester, C. H. Johnson, V. J. King and E. H. Banister. President, H. L. Clark; Secretary, John N. Lyman; Treasurer and Superintendent, G. L. Manchester.

MESSRS. W. H. CARPENTER, W. G. McCarthy and Jno. W. Amend, have filed letters chartering the South Beloit (Wis.) Gas and Electric Company. The paid in capital is $10,000, but provision has been made to increase this subsequently to an amount equal to the Company's needs.

THE Vincennes (Ind.) Commercial, of the 25th ult., is our authority for the statement that the proprietors of the Vincennes Light and Power Company, will, on the 1st of September, abandon altogether the manufacture and supply of artificial gas. The reason given is, "Owing to inability to operate under the present conditions."

THE Western Gas Construction Company, of Fort Wayne, Ind., has been awarded a contract for the construction of a complete water gas plant at Chikasha, Okla.

THE Chamber of Commerce, of Azusa, Cal., is anxious for the establishment there of a gas plant, and it is said that Los Angeles capitalists are ready to submit a proposition on said account.

THE Directors of the Lawrence (Mass.) Gas Company have declared a regular semi-annual dividend of 4 per cent., payable on the 1st inst.

MR. GEORGE A. NICHOL, Permanent Receiver of the New Bern (N. C.) Lighting and Fuel Company, gives notice that he will file his rulings on all claims presented to him on or before the first prox., and he further directs that all parties objecting to such rulings shall file exceptances prior to the 15th prox.

HERE is another evidence of the illiberality of gas companies to the communities that they serve. The authorities of Mankato, Minn., owing to the scarcity of water, ordered that the flushing of the street mains be discontinued. The Mankato Gas and Electric Light Company, however, came to the rescue of the residents through notifying the authorities that they might have free use of the Company's wells for flushing purposes.

THE Peoples Gas Light and Coke Company has opened a transfer office in Chicago (in the general offices, 157 Michigan avenue), which will be a great convenience to many brokers, both in Chicago and New York.

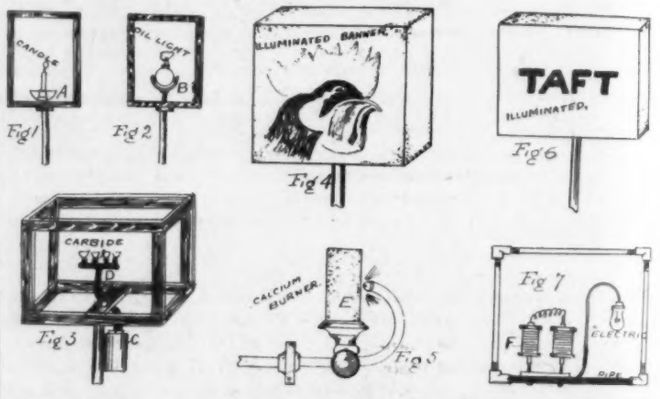
THE authorities of Calcutta, India, have agreed upon the use of the mantle lamps for the illumination of its streets, and recently we know that a New York house with large affiliations in this city has been in touch with the authorities of Soerabaya, Island of Java, looking to the installation there of a plant for the lighting of its principal roadways.

The Illuminating of Political Banners.

[Prepared for the JOURNAL, by "R."]

The political banner season is near at hand, in fact it is here, and the men who design and construct banners for the political parties will be at work in earnest. There will be banners of all kinds this coming season, some of which will outdo the elaborate examples of 4 years ago. In past years voting clubs were satisfied with dimly lighted banners arranged cheaply and quickly, but in modern times the demand is for well constructed banners, properly designed and neatly painted. It is necessary that the light be strong, for the attraction of the banner depends very much upon the brilliancy of the light within. If this light is feeble the best designed banners will fail to give satisfaction. The men whose business it is to furnish light for all kinds of purposes are not behindhand in providing a brilliant illumination for republican or democratic or any other sort of banners. Some of the schemes for lighting the banners are exceedingly praiseworthy. Formerly the voter was satisfied if he could carry a banner with a candle inside or a whizzy oil lamp. Now he wants carbide light, a calcium light or even electrical lighting. Gas tanks with storage capacity enough to last through an evening are used for floats. Some of the modern banners are so bulky that 2 and 4-wheeled vehicles are needed to convey the same.

They used to depend exclusively upon wood to make the banner frame; nowadays you can find metal frames, or frames made of gas pipe. Many of the gas pipe fitters of lively towns are earning pin money by constructing pipe frames for banners. In some cases bicycle tubing is used, which makes a more expensive frame, but a neat, strong, lasting one. The commonest type of banner is shown in Fig. 1,



in which a candle is set as at *A*. With this device the banner has to be held straight, or the melted wax from the candle will overflow the drip pan and souse the clothes of the enthusiastic voter. Sometimes the swinging torch lamp is used, as at *B*, Fig. 2. Hence kerosene oil is available; but these oil lights smoke and make an unpleasant odor.

Gas men who have fitted up side shops for the designing and making of banners for the elections find that they must be in position to construct all kinds of banner frames with the various kinds of lights employed therein. Facilities are at hand for the making of the acetylene light banner if desired. Usually this light is fixed, as in Fig. 3. There is a carbide generating tank, like a bicycle light generator on a larger order, arranged as at *C*. The carbide drops into the water in this tank, and gas is formed to supply the row of jets above in the banner through the pipe *D*. An exceedingly brilliant light results, and any sign painted on the sides of a banner lighted thus will show very brilliantly and clearly.

Some of the banners which have to be ornamented with forms are shown in Fig. 4. This part of the work is usually done at the neighboring paint shop. In the making of the banners two or three concerns often combine. The gas and steam fitter will make the frames or the woodworker will turn out wooden ones. The gas man will take in hand the illuminating part in his shop, utilizing odd time for the purpose. The sign painter will do the decorating.

As to the calcium jet which is used in some of the big floats, and in cases in which about 400 candle power may be needed in one jet, the burner employed is like that in Fig. 5. The gases made in the hydrogen and oxygen tanks are combined in the two tubes leading from the tanks beneath the body of the wagon to the entrance of the burner. The flame which results is very hot. The lime is soon heated to a white heat by the powerful combination of burning hydrogen and

oxygen gases at *H*. This glaring light is maintained throughout the service and the banner becomes brilliantly illumined.

Fig. 6 shows one of the banners covered and painted and ready for use. Some of the users of banners want electrical lighting devices attached. Fig. 7 shows the plan usually employed. The battery is adjusted, as at *F*. The electrical incandescent globe is supported as illustrated.

Quite a steady and effective light can be derived. But the electrically lighted banners are not perfected as yet. We hear complaints concerning the breaking down of the same just as the illumined reading on the banner is wanted most. One man told me that last season the electric light went out in his banner just as the procession halted in front of the house of the candidate. The latter had just begun his speech with reference to the good things inscribed on the banner, when the light went out. Of course, the man carrying the banner was accused of putting the light out to bring ridicule on the candidate, etc.

[Continued from Page 137.]

FOURTH ANNUAL MEETING, IOWA DISTRICT GAS ASSOCIATION.

Held at Omaha, Neb., June 17, 18 and 19, 1908.

First Day—Afternoon Session.

The President announced that the Committee to name a candidate for

Affiliation Representative

would comprise Messrs. G. S. Forest, E. H. Waring and L. L. Kellogg. After which the

Discussion on the Borden Paper

was resumed.

Mr. Fair – I was especially interested in the remarks of Mr. Clabaugh this morning. It would certainly be ideal if we could run along on the lines he mentioned, but I fear if we tried to introduce that brotherly love business to any extent in the small town, where everybody knows everybody else and is more or less familiar with each other's business, we would soon be in a heap of trouble. The largest payroll in our town is that of the Iowa Central Railroad, and at the present time a considerable number of the employees are on strike. If I should say to one of them, "That's all right, old man, we will let these bills stand until you fellows win out or obtain other employment," I think the chances are he would announce benevolence at the next meeting of their union. I don't take any stock at all in collection agencies. As Mr. Borden suggested, for the most part it seems a case of "Heads, you win; tails, I lose." He also brought out the matter of correspondence. We don't write any dunning letters. The only time I think where corresponding proves effective is where some thoroughly reliable consumer, through absence from the city or downright carelessness, allows his bills to accumulate. In a case of that character I have found it has been very beneficial to write a short note reminding the consumer that his recent bills amount to such a sum, and that we would be pleased to have his check covering same. I think Mr. Borden's paper went into the matter in a very interesting way. At any rate I got some valuable hints from it.

The President—Mr. Maynard, what is your method in Waterloo?

Mr. Maynard – Braving the danger of unorthodoxy, I believe the delinquent customer the most important on our books – important in that he is entitled to the most attention, because there is no need of concern or anxiety regarding the sure-pay customers. On the latter you can figure a certain per cent. of profit, while on your delinquents, properly handled, you can realize the full 100 per cent. In every large or successful mercantile establishment you will find an official bearing the important title of credit man to whom is submitted every account, past or prospective, and according to his judgment almost completely does the beginning or continuance of business with any individual rest. He weighs past personal performance in the payment of accounts, judges of the intention to deal honorably with his firm, and extends credit or refuses it upon his judgment as determined by contributive causes. Every delinquent is a separate problem requiring special treatment. In diphtheria cases the physician knows that he must use anti-toxin, but upon his judgment rests the decision whether it be 1,000 units or 3,000 units. His aim is the cure of the patient. So with delinquents, you must decide whether they need time or a collector. This last is the final resort, and should not be used as a first aid to the injured. You have spent your good money in securing business; go slowly in your efforts to secure its return or you will lose it. I am no advocate of the follow-up system of letter writing. I believe in persistent collectors who use tact and discretion. If they lack these qualities let them try others. When a case is finally properly diagnosed, proceed boldly; carry the account, if good judgment dictates, or terminate the business relation for the same reason. Never threaten immediate removal or a suit except you make good your threat. Never establish a discount day that you do not rigidly enforce. Always temper justice with mercy, and, my word for it, you will secure the goodwill of the delinquent and establish that of your superior officers.

Mr. Borden – I want to correct in some little measure the impression that Mr. Clabaugh seems to have obtained—not at all his fault; but I think through my own phraseology as much as anything. He has taken an able exception to my expression concerning a certain method used. I mentioned that I had known it to be used. I have known a company to send a bill for an amount somewhat larger than the amount really due in order to bring the subject to the office, and I must admit that this savors on the face of it like a bit of sharp practice. I do not wish my statement to carry with it the idea that this method should be used prevalently, nor do I advocate it in any measure, and as a matter of fact it has not been used in our business, but it has been used in other lines of business and accepted as perhaps the last resort in the case of a delinquent that has every intention of defeating the collection if possible. Such cases are isolated, and the matter simply resolves itself into a question of ends. I agree fully with Mr. Clabaugh that it is due to our customers that every consideration be shown them.

The President – I would like to ask Mr. Houck what is done with their customers? His is a municipal plant, and I am sure it would be of great interest to hear from him.

Mr. Houck—That part of the work falls largely to me, and I have had little difficulty in keeping accounts paid up. In cases where I think it is hard for the customer to meet the bills I put in prepayment meters.

Mr. Clabaugh – Does not Mr. Houck hold the property owner liable for any bills that may accrue, so that he really should not have any delinquent bills at all? That is done in municipal plants in other places.

Mr. Houck—We have no such ordinance. The great trouble I have is with the water works system. The people of our town take great interest in our gas plant and pay their gas bills very promptly.

The President—Mr. Heaton.

Mr. Heaton—I am in the primary department on this line so far, for our plant has only been in operation 6 months. So far we have been fortunate enough not to have any delinquent accounts, hence I am not in a position to state what system we might adopt when our business grows to such an extent that we will probably have delinquent consumers.

Mr. Kellogg – One point in the paper discouraged the use of collection agencies. I think it would be of benefit to everyone to steer clear of them, for I have had some experience with them, and I am quite sure the results will not be satisfactory. The collection agent has a sure thing, and after he once starts you can't get rid of him. After his term has expired he keeps on collecting bills just the same, and he never stops as long as he can ring up a dollar anywhere. The discount day is a very important thing. Ours is on the 10th; 75 per cent. of the bills are paid in the office, where we can explain the bill much better than a collector can.

Mr. Clabaugh – Only 8 per cent. of our consumers lose the discount, and that 8 per cent. is very much more than all our losses combined in bad bills.

Mr. Waring—This discussion interested me greatly, and it seems what I have heard here could well be expressed by the motto of my native State, "Wisdom, Justice and Moderation."

Mr. Stewart – After a consumer has been delinquent to such an extent that the company sees fit to discontinue serving gas through a regular meter, and a prepayment meter is installed, if we make every effort to collect the delinquent bill and fail, what is to be done then? Shall we continue to serve them with gas through the prepayment meter, or is it the right thing to cut off the gas that we are now serving them with that they are paying for? That is a question that has come up to us.

Mr. Forest – We have had such an experience. We installed a water heater, fixtures and lights complete, amounting to about $60, with a promise to pay in instalments. The first instalment was never paid,

A prepayment meter was installed by request at the time the installation was originally made. The matter ran on for 3 months without payment. Our customer was asked if he thought it would be easier to make the payments 25 cents at a time by changing the wheel in the prepayment meter from $1.50 per 1,000 to $2.50. He said that would be perfectly satisfactory to him. The $60 is not all paid yet, but he is using in the neighborhood of $18 to $20 a month, and does not question for a moment that we are trying to do the fair thing by him.

Mr. Stewart—What would the gentleman do in case that consumer would repudiate his verbal agreement, if the question came up as to whether he was getting the gas he was paying for at the established rate of the company? I would think it would be necessary to have a written agreement in such a case.

Mr. Forest—The understanding was that 10 cents of every 25 went on the old account and 15 cents went to the gas account for the gas consumed. That was a verbal agreement. Of course, I presume under our ordinance he could throw us out on that and tell us to go back to the 15-cent wheel, for our ordinance prohibits collecting more than $1.50 a 1,000. In our experience of about three years in only two or three cases has there been any question about the payment upon a reasonable solicitation. We have had cases where the account has run over a year, simply through extending it from time to time. In the three years we have lost but $8.10 in bad accounts, and that was from a billiard hall account for gas for one month. The men sold out and refused to pay. We gave the account to an attorney for collection, who took half for his fee.

The President—Mr. Forest's method has been adopted in London for selling gas stoves, but I presume that we here would require either a special ordinance or a special contract. It is a legal question that would have to be taken up in the individual cases, but it is quite customary abroad to do that. Replying to Mr. Stewart, I think it is quite a question whether the company would get into any trouble over it, for the credit would show on the books if properly kept. If a man is not given proper credit on the books it would show that he is paying more than the legal rate for gas and under those circumstances he would be entitled to recover.

Mr. Green—What would you do in a case where you charge meter rent and have prepayment meters? How do you collect the rental?

Mr. Fair—We charge a meter rent of 25 cents a month, but in case of prepayment meters we have never made any attempt to collect that. If we find no money in the meter at the end of 2 months we make an investigation, and if we learn that there is no likelihood of any gas being consumed we remove the meter. It is hardly worth while, I think, to go to any great trouble to collect that 50 cents.

Mr. Green—The thought came to me, when Mr. Forest spoke of setting the meter at 25 cents per 100 instead of 15, why couldn't that be worked in the matter of rental?

Mr. Forest—It would be a very difficult proposition to do so, because your wheels are set in multiples of 5—that is, representing 5 cents for each cog in the wheel; so it would not be in proportion to the amount of gas used. When you collect 5 or 10 cents per 1,000 feet on an old account it is in proportion to the amount of gas consumed, and the wheels which you insert in the meter are made to represent that amount. We do charge 15 cents a month rent on standard meters.

Mr. Hensinger—We charge 50 cents a month for meter rent, but don't aim to charge anything where 200 feet or more a month is consumed.

The President—If your customer refused to pay any meter rental would you remove his meter?

Mr. Hensinger—Yes. Our minimum charge for a 3-light meter is 50 cents, for a 5-light meter, 60 cents. Most people use electric light and have the gas meter only for convenience.

Mr. Kellogg—We ought to change the name of this "meter rent" to "minimum charge." During the time I charged meter rent I made more enemies for myself than by anything else I ever did; but I believe we are entitled to the minimum charge, and there is no reason why we should carry an account on the books, read the meter every month and furnish service for nothing. We ought to get something out of it, but we ought not to call it meter rent. There is something about it that irritates a man, and the minimum charge does not seem to sound so bad.

The President—The question of meter rents really does not enter into this subject. I think it would be advisable to take it up as a topic of discussion later on, for it is a very important question well worthy of discussion. It seems not at all improper that the gas company should be allowed to make such a charge, whether it is in the form of meter rental or minimum charge, when it holds itself in readiness to serve its patrons.

The President then introduced Mr. Thomas Crawford, of Clinton, Ia., who read his paper on

ATTENTION TO CONSUMERS.

[For the text of the Crawford paper, see JOURNAL, *ante*, p. 53.]

Discussion.

Mr. Stewart—What does Mr. Crawford do with his last month's readings when he tears them out from his meter-reading book and makes a small slip? What stands as a record for them?

Mr. Crawford—In one drawer we put all of the perforated sheets that we tear off and keep them for 6 months. Then we destroy them. Keeping them separate for each consumer.

Mr. Fair—One suggestion I might mention on this point of having consumers learn to read their meters, a practice the value of which cannot be overestimated. We have in our office an exhibition meter with glass top and front, and when a new consumer makes an application for a meter we instruct him how to read a meter, and ask him to take the time and interest to read the meter himself and verify the meter readings as soon as the bills are rendered.

Mr. Martin—We don't have one general form as Mr. Crawford has, but in any case of importance we have separate papers made up. For instance, when a man takes a piping order he gets the signature of the party for whom the estimate was made at the time; or if he is not willing to leave his signature he is given a duplicate and instructed to sign that and send it to the company if he wishes the work done. Of course we are always quite sure of the responsibility of the man before we put the order out. If he doesn't happen to be the owner of the building, we look up the tenant to see if his responsibility is sufficiently great for us to put the work out.

Mr. Honeywell—I think the importance of this subject cannot be overestimated. We go a step farther than Mr. Crawford, in having the order signed by the party who does the work; then we send out a return notice stating that the work is satisfactory or unsatisfactory, and every week we give a bonus of $4 to the fitter and $2 to the helper who have the most favorable postals returned. I find that the fitters are particularly anxious to please and see that everything is satisfactory before they leave the house. These subjects of "Delinquent Accounts" and "Attention to Consumers" might be grouped together. I don't think gas companies are eleemosynary concerns. I agree with Mr. Clabaugh that we should do all we can to help the consumer in hard lines, in time of sickness and when he is out of a job, thereby gaining his friendship; but I think it ought to be instilled into every consumer's mind that the gas company expects its money. I believe we ought to be good collectors, for every time we let an account get behind we are helping to make a deadbeat out of that man. We spend probably more money in our complaint department than in any other similar department of our business and we aim to give the best possible service. We think the first thing the people of a town are interested in is complete service from a geographical standpoint; the second thing is good service, and the last thing is a low price for service.

Mr. Crawford—I hope that the statement in my paper in regard to prepayment meters will bring out a little more discussion. We have 4,000 gas and electric meters installed, one-third of them prepayment. Clinton is a railroad town, and the people are pretty hard to catch sometimes on account of their runs. We found they didn't get their money by the 15th and a thousand other things that you know as well as I do. The prepayment meter has cut our distribution account from about $400 a month to $175. Last month we had 11 kicks on bills out of our 4,000 consumers, and 500 of the people that now have prepayment meters were habitual kickers. They kick, as they do in every place, because it is the gas company; but we are rid, we think, of the obnoxious kicker on discount day.

Mr. Potter—I don't agree with Mr. Crawford as to the prepayment meter. I think it is all right in its place, but if we are going to set prepayment meters for everybody, what is the use of having an office? One of the main things in having on office is to bring the customer there, and if we don't have some way to bring him in we are not going to educate him to the use of our appliances and the material we have for sale outside of gas. During the first 10 days of the month, which is our discount period, we sell more appliances and Welsbach material than all the rest of the month from sales made in the office. I don't believe in prepayment meters being set promiscuously. Our experience is that the prepayment reduces consumption. Mr. Crawford remarked that the consumer is a chronic kicker; that he will kick anyway. I don't think that is the right way to look at it. I honestly believe that if a consumer kicks he thinks he has an honest kick com-

ing, and it is the duty of the complaint clerk to get him out of that idea. As to not treating a consumer right when he makes a complaint, if you have a complaint clerk of that kind I think he is out of his place.

Mr. Stewart—Do the gentlemen who favor the prepayment meter ever have any complaints from the consumers using them? I never hear them speak of that. In Waterloo we have complaint from people using them as to their gas bills being high.

Mr. Green—I represent a very small plant, and I am very much in favor of the prepayment meter. Three months ago we had out 12, and we had a great many kicks. Looking into these cases individually, I determined in nearly every case they were chronic kickers, so in an easy way I talked them into the prepayment meter, and haven't had a kick from one so far. When I took charge of the plant 10 per cent. of total meters were prepayments, now the per cent. is 33⅓, and some of the best families in town are asking for them. It has become a craze. We have less kicks, not only on the amount of the bills but regarding the service. Of course when there is any leak they come in anyway, but we have never had any kicks on the amount of bills from the prepayment meter.

Mr. English—What does Mr. Crawford do in case of robbery? That is an old question, I believe. We had 6 or 7 meters robbed in one week and never caught anybody. Some we made put up for the amount taken out of the meters and some bluffed us out of it. As far as we are concerned, we are getting them out as fast as possible. We aim to keep track of all our complaints, whether large or small, following them up and keeping after them until the trouble is entirely cleared up. I think we make friends every time we do that. But on the prepayment meter I declare eternal war.

Mr. Vincent—As I recall it, when at one of the Council meetings the question of discussion topics was brought up, we purposely omitted the prepayment meter, because, as all roads lead to Rome, all papers seem to lead to prepayment meters. We don't like the word "complaint" in Des Moines; with us it is "trouble." Our trouble men are all mounted on bicycles in order to give very prompt service. Any report of trouble is attended to within 2 hours from the time it reaches the office. Special service such as a bad leak is attended to immediately. I think promptness is one of the essential features in giving service to consumers. A customer who makes a kick and it is not attended to until the next day, has a long time to think it over and it seems to grow much worse than it really is, while if it is attended to promptly he forgets all about it, and only remembers how very prompt the service of the gas company is.

The President—Mr. Chubb, what do you do to give your consumers in Sioux Falls prompt and careful attention?

Mr. Chubb—The calls are telephoned to the distribution shop and a man goes out immediately. When orders come in late in the afternoon we explain that the work probably will not be done until the next morning, but if it is really necessary we get it done for them. One point in the paper that I disagree with is I don't think giving away appliances or selling them at cost is necessary. When I went to Sioux Falls over 3 years ago I found that all the stoves were being set practically at a loss, and everybody in town knew the prices. I have raised them $4 apiece since going there, and our sales are two or three times as great. We get the money and are making a little profit on them, and I do not see but people are just as well satisfied as they were before.

Mr. Borden—I believe we should consider that there is a vast difference in the caliber or temperament of the inhabitants of different localities. The rules that will apply in one town will not apply in another, other things being equal—approximate price of gas, for instance, and other conditions nearly on a par. These questions must be handled more or less peculiarly to the town in which the question arises. That same thing is true, I believe, in handling the complaint. In the larger plants you must have system that will not apply to the small plant, for you would burden your management with too much detail and an expensive force. We aim to sell our appliances at cost, as nearly as possible and get out whole, as the expression goes. We do this only because we have to in order to get the business. As to the taking care of complaints we have perhaps an advantage over a larger plant. We can keep our same fitters in touch with them personally for a considerable length of time. I have two very valuable men who have been with me for 4 or 5 years, which condition is not altogether feasible, perhaps, in a larger plant. They don't need to have a bonus offer or any other inducement than the fact that they are getting well paid and are expected to do their work properly. When they are given an order it is to be looked after, and we always know in the office whether that has been done properly.

The President—What do you consider the proper means of obtaining promptness in answering your trouble calls, and in what order do you consider the troubles should be remedied as to their relative importance?

Mr. Borden—At such times as our installation work is not too heavy, we aim to set apart a man to take care of that work and look after it just as promptly as possible. Being in the office all the time I receive many of these complaints personally, and I am prompt to note that the order blank is placed on the workman's hook and that just as soon as he puts in an appearance he takes care of it. Of course, it is understood that when our workmen go out to do a job they come back as soon as they are done and are in readiness to take up a new job. That depends altogether on the reliability of your man, or of your system generally. I think we take care of our calls as promptly as could reasonably be expected. We get orders off the hook inside of an hour or two in most every case, unless on certain occasions our men are busy with the installation of new work and we have to spend some time getting them off that in order to get them on the other. Of course, we have nothing like the volume of repair work that the larger plants have, and can't set apart a man to especially take care of the troubles. We repair leaks in services, clean water heaters, adjust burners, etc., without charge, and when a man orders a new mantle over the telephone we send it up and in many cases put it on the burner. Sometimes an order of that kind has to be delayed a little and give way to work of more importance, but we do all we can, by way of concession you might term it, for the welfare of the consumer.

The President—Do you instruct your men to drop fitting work or anything of that kind in order to repair a leak in house piping or service?

Mr. Borden—We would take a helper off of such a job as that, provided it didn't interfere with that particular job to too great an extent. That is a matter that we have to judge according to the importance of the case.

Mr. Martin—I understand you want to know which gets the priority over the other, and whether a leak order should be taken care of first of all. That is the custom with us.

Mr. Honeywell—Mr. Borden may have only two fitters, but I think if he will try that bonus plan he will get some result from it. Human nature is all the same. We are all after loyalty and co-operation, and I think one of the best ways to get it is a small bonus to fitters and men in that line. We take care of the leaks before anything else, the matter of service coming next. When a leak report comes in it is telephoned immediately to the shop.

Mr. Johnson—Do you have some men working at stoves and others connecting water heaters, or are they all doing that work? If one man has 6 orders in a day and another has 10, and they both complete the work satisfactorily, how do you make the division?

Mr. Honeywell—It is based on a percentage. Some fitters will do a number of small jobs in a day.

The President—Mr. Averill, what is you practice in Cedar Rapids?

Mr. Averill—We have an order clerk who answers the telephone and gets most of those calls. All these orders are registered and the foreman of the shop lays them out in routes for the wagons. The orders come back signed by the fitter, then are checked off this register when they are completed and a record kept of the person by whom the work was done. We have an ordinance fining us $100 for setting a meter on a system of piping that has not been inspected by the city plumbing inspector, so we are not troubled with any leaks inside the house. We pay no attention to anything beyond the meter. The fixtures have to be inspected by the plumbing inspector, and the owner gets a written certificate with the name of the fitter on it, and we are given one as a clearance to set the meter. The consumer in that way always has the name of the man who did his fitting or hung his fixtures up and naturally goes back to him if he has any trouble afterwards. The orders are gotten out the same day; everthing must be done before the men leave at 6 o'clock. One important thing is teaching people to read their meters. We don't print the dial on the back of the bill, but when anyone brings in a bill we will stamp it on the back and ask him first to read his own meter and see if the reading corresponds, and if not let us know and we will come out and read it. We teach a great many people to read their own meters, and after they do it a few times they usually know what they are doing.

[Upon motion, Mr. Crawford was tendered a vote of thanks for his paper.]

Mr. Crawford—Let me give you some figures on prepayment meters: Consumption last year through ordinary meters, $23,000; prepayments, $22,000; meters broken into, 15; 8 collected from, the

balance lost. Prior to our installment of prepayment meters: Two collectors at $60 per month each; now one collector half a month, $30. In two other places in which I am interested, one has 1,800 meters, 1,100 prepayment, 700 ordinary; the other has 2,000 set, of which 1,300 are prepayments. We furnish all our workmen with bicycles. We pull any man off a job to look after a leak, no matter what he is doing. Regarding selling appliances at cost, you can't ask any more at a place where you have been charging pretty close to that; if we try it they will come in and say that we used to sell a stove for less money. As to people being different in different localities, I think they are all pretty much alike. As to the minimum charge you can't collect unless your ordinance is satisfactory, and it cost us $150 to find it out.

Mr. Vincent—Has Mr. Crawford any large prepayment meters? The consumption in both types is very close.

Mr. Crawford—We have several 10-light and about a dozen 45-light ordinaries, but our largest business is on the 5-light meter. We don't set anything smaller than 5-light.

Mr. Potter—What steps does Mr. Crawford take to collect what is coming to him on a meter that has been robbed?

Mr. Crawford—We have an application by which the consumers agree to stand good for the meter. We loan them the appliance and they are responsible for it, and if the meter is broken into they have to make good. About 7 times out of 10 the agreement holds, the other 3 times we lose. You can talk about having ironclad rules, but nobody does business that way. Some consumers must be talked to differently from others. There are people who would willingly and deliberately beat the gas company; I don't believe any amount of soft soap or hot air will get them. You must size your people up, give them all the leeway you can, and when you decide what to do with them go ahead and do it. If their business is valuable, try to let the bill run along a little. We have sold so far this year about 220 ranges; 200 are paid for now. We sell them on 3 months' time, charging $5 when the range is delivered, and don't set it until they come down with the $5.

The President—Do you have a form of contract that makes the consumer responsible for your prepayment meter in case of robbery?

Mr. Crawford—Yes.

The President—Is it customary for the plants of which there are representatives here to have a form of contract which makes the consumer responsible for the condition of the prepayment meter in case of robbery—that is, for the amount of money lost and for repairs to the meter if it is broken in the robbery?

Mr. Clabaugh—We have a contract of that kind, and have had very little trouble in collecting the money taken out or for repairing the meter. I want to emphasize the point that Omaha under no consideration whatever would set a prepayment meter at one cent over and above the regular price. We have 100 meters set to-day in which we could not get the right wheel. Our price is $1.15 net, and the price to the consumers on those 100 meters is $1.12½. We now are able to get the right wheel and charge them correctly, but we have given them the 2½ cents rather than put in the wheel at $1.17½, which we could have done very readily. We heard here about delinquents on the prepayment meter. I won't go into the question of the meters going long, in which case the company loses the money, or going short, because we know there are a great many instances of that kind. To my mind one of the most important points brought out here was that by having prepayment meters the customers were not brought into the office to see the appliances. I presume we all have solicitors, but they may miss these places. And another thing is that they never know anything about all this courtesy that has been talked about that should be in the office. If Mr. Crawford made his terms a little easier he might have sold 420 stoves. He starts out to be most courteous, but comes back to tell them they must pay for their stoves in 90 days, and carries that out, believing it good business. You may say all you please about people being the same everywhere, but I tell you locality has a great deal to do with the people. People are different and every locality is different, and I think we must handle all of these subjects individually, very often personally, in order to know how to deal with every customer we have. But we must be courteous. There is no question about that, everybody understands it. You may talk all you please about "hot air," but I tell you it goes a long way with a great many people, particularly when it is backed up by action.

Mr. Stewart—What would Mr. Clabaugh do, after removing a regular meter on account of non-payment of bills and setting a prepayment meter, with the hope of collecting his delinquent bills, after making up his mind that he could not do it?

Mr. Clabaugh—I would have a contract with that man by which he would agree to pay a certain amount of his old bill each month, or give us an opportunity of removing his prepayment meter. The fact of his coming in there on a prepayment meter indicates that he wants to burn gas. I would remove his prepayment meter if he didn't keep his agreements with us, because I do not believe in establishing any precedent that a customer could come in and ask for a prepayment meter and we cut out all his old bills. We live up to our agreement and expect our customers to do likewise. We have had hundreds of cases of that kind, and our agreement for a prepayment meter reads in just that way. Also, as we all know, we cannot shut off a consumer who is using a prepayment for a sundry sale. We have an agreement that he will pay his sundry sales' bill or we have the privilege of removing the meter. Heretofore we have never been able to do that, but we have him now just where every business man ought to have his debtors.

Mr. Crawford—Suppose a man owes $6 for gas. We agree to set him a prepayment meter and he agrees to pay us $1 a month. He doesn't pay it, and we say to him that we must take out the meter. Suppose he is running a coffee roasting establishment, for instance, has a big order for coffee and has put his money in the meter. The gas is paid for and unconsumed. We go and take his meter out. He comes on to us and beats us, and sticks us for the amount of his order and the amount of his damage, and a good deal more, too. If you get a meter in a man's house and he keeps dropping the money in it, you cannot legally remove it.

Mr. Clabaugh—We took that up with our attorney, who says we can remove the meter, crediting the account with the amount overpaid in his meter. We have never had a test case, but we don't fear any case of that kind at all, for we think we are right.

Mr. Crawford—But thinking you are right doesn't make it so.

The President—The courts in most cases have treated a delinquent consumer as they would the creditor of an ordinary concern; and while it has been held in some cases that, in order to collect a back gas bill, you will have to sue the man and leave his meter in, I doubt very much if that construction will be placed upon it by a higher court.

Mr. Martin—I think, casting aside the legal aspect of the matter, when a person wishes a prepayment meter, and you have a regular form which he should sign, it is absolutely necessary that the terms of the contract should be gone over with the consumer to show him his responsibility and the nature of the contract that he is signing between himself and the company. We call their attention to the clause Mr. Clabaugh spoke of, giving us protection against loss on sundry accounts, and they go away feeling the weight of the whole thing. It has a tendency to lessen if not altogether avoid the loss on sundry accounts, and prepayment meters, too.

The President—I think consumers who will eventually beat a gas company on such a proposition are really very small in number. I have found it so in Des Moines. If there is no further discussion I will ask Mr. J. C. Grey, of Des Moines, to read his paper on

THE HYGIENE OF BURNING GAS.

[For the text of the Grey paper, see *ante*, p. 8.]

Discussion.

Mr. McLean—I have not prepared any discussion of the paper, but am very glad instead to say something about it and to give expression to what I think must be the feeling of all members who have listened to Mr. Grey's paper. We are indebted to him for its preparation. He has gone into this subject very clearly and has stated his propositions quite fully and with sufficient elaboration so that it will not be necessary on my part, I believe, to further amplify anything that there appears. I have always felt some interest in this subject that Mr. Grey has taken up, and felt, too, that the hygienic value of gas as an illuminant has been too little considered by the gas fraternity and that we are in a measure to blame for the widespread, erroneous impression existing to-day in the minds of the public generally respecting this subject. It is particularly regrettable that there should be so much ignorance (or perhaps merely inattention) to the facts on the part, especially of members of the medical profession, architects and ventilating engineers. It seems none of them have really made inquiry into the effects of gas burning upon the atmosphere of the room in which it has burned, and the general impression that exists on this subject I think is directly opposite the truth. When we go into a theater we think when we see the lights burning, perhaps that the atmosphere of the auditorium is not as pure as it would be without them, but we know as a matter of fact that the very contrary is

true. If we put a certain number of human beings into an auditorium which has no artificial light and analyze the atmosphere of that room, it would be found in all cases that the air is not so pure as it would be after the lights were turned on. The reason is plain, too. The heat which the light produces serves as a means of carrying away the noxious exhalations of those in the room. One other matter which does not relate strictly to the hygiene of burning gas, but which is kindred to it, is the effect of gas burning upon metal fixtures in rooms; for instance, in jewelry stores upon the silver and other metals which are exposed. I recall an experience of my own where gas was excluded from a first-class jewelry store as an illuminant for the reason, as one of the proprietors stated, that gas tarnished the silver. It seemed that the man was very illogical, for several reasons. In the first place, there was no sulphur in our gas and never had been. In the next place, gas was regularly employed in blow-pipes and for all other purposes about his shop, although he did not use it as an illuminant; but in order that we should not rest under a false charge I proceeded to the drug store on the corner and purchased 5 cents worth of acetate of lead and called on this jeweler. I told him that while of course we were very sorry to lose the patronage of so desirable a customer, we were even sorrier that he should have such an erroneous impression as to the effect of gas on a stock of goods. I told him that if there were anything in the gas that would tarnish the silver, it would quickly show on the acetate of lead, and on turning on the gas and applying it to the burner it showed not the slightest effect. I then called his attention to the fact that they were heating this establishment by means of a hot air furnace, and on putting it down over his register it was almost immediately discolored. I said: "Here is something that is almost constantly discoloring your silverware and the quantity of sulphur and other oxidizing agents that comes through this register is many times more than it could ever be from the gas. In many homes one will observe that, after the boiler is started in the winter, the silverware tarnishes more quickly, and yet persons will sometimes abandon the use of gas because of its effect on the silver and continue to use the boiler, which is the real cause of the trouble. Some of the facts as to the analysis of the atmosphere of rooms, to which Mr. Grey has called attention, and which I think he has stated very well indeed, are strictly confirmed by investigations that have been made by scientific bodies who undertook analysis of the atmosphere of rooms in which different illuminants have been used, both in Great Britain and in this country. I think the latest report of a really disinterested scientific body that I have noted is the one made to the Franklin Institute, Philadelphia, by the committee of whom Dr. S. Weir Mitchell was chairman. Many of you are no doubt familiar with the substance of that report, but it in every way confirms the statements which Mr. Grey gives us in his paper. It would seem to me that, aside from the value to the membership here of the information which Mr. Grey's paper contains, it ought to be of practical value in a business way to us and to all others engaged in the business. If we were to take the substance, at least, of the paper, and let it be circulated, if not among all our consumers, at least among the members of the medical profession in our communities, it would no doubt convey generally a great deal of original information. I think while they recognize the truth of it, it is very well to remind them of the fact, and it is also well to let the architects know that the most hygienic illuminant to-day is gas.

Mr. Haskell—I would like to ask the effect of gas upon plant life. My little plant was originally a gasoline plant. Last year I changed it to water gas, and very soon after that I noticed effects upon plants that are not advantageous. That is one of the objections I have to meet in my town.

Mr. Grey—If the gas is properly consumed it has no effect upon the plants.

Mr. Waring—In answering the question I think it might be well to make it a little clearer that the only products of complete combustion are carbonic acid and nitrogen, which are the very things the plant wants. If you have complete gas combustion and no leaks you are feeding your plants the very things they want, but if you have a gas leak or incomplete combustion, or have sulphur in your gas, you will kill all the plants in the house.

Mr. Vincent—It occurs to me Mr. Haskell's trouble may be due to the fact that his gasoline gas was lean and of low thermal and candle power, and it is quite possible that his adjustments were for this weak gas, and that when he put on water gas he had incomplete combustion and the need of readjusting.

Mr. Haskell—I hardly think that is the case.

Mr. Gamble—If in a room where gas is burning there are burners out of adjustment, is it true that, if you have another flame properly adjusted, the products of incomplete combustion in the improperly adjusted flame will be taken care of by the properly adjusted one?

Mr. Grey—If they are in position to do that it would be true; but in the great number of cases there would be no means of consuming the gas and it would escape into the room.

Mr. Gamble—I would like to ask also if it is a positively known fact that the air entering through the walls of a building is enough to revivify or renew the air that is vitiated by a burner?

Mr. Grey—The porous construction of building material would, of course, take care of a certain per cent., but not all of it. If it would take care of all the vitiated air, it would not be necessary to have any ventilator. It is assisted greatly by window openings and doors and defects in the construction.

Mr. Gamble—In getting up your paper did you come across any statistics which would show just how much the diffusion would take care of?

Mr. Grey—No; I did not.

Mr. Gamble—You spoke of the gas in the instantaneous water heater coming in contact with the water and purifying it. Is it not true that the gas puts impurities into the water—that is, you get a certain odor in the water rather than a purifying effect?

Mr. Grey—It destroys the organic matter or germs.

Mr. Gamble—My experience has been that those contact heaters are very unsatisfactory, and, whether they destroy organic matter or not, they put something else into the water that makes the heater very unsatisfactory. The subject of gas heaters was not touched upon very much by Mr. Grey, except to say that they are good things. I would like to ask if the heaters of luminous tip type are preferable to those with the Bunsen form? The hood over the stove seems to me a source of a great deal of dirt. When you place them 36 inches above the stove they are just out of reach of the cleaning zone, and the tops collect much grease or dirt, which is objectionable in a kitchen. It seems to me some other form of taking away the products of combustion should be devised which would do away with the hood entirely. Just what that is I am unable to suggest.

Mr. Grey—As to choice between the blue flame and the luminous tip, I would say that the blue flame is preferable. Although hoods on stoves are rather hard to keep clean and are dirt catchers, there is hardly any other way at present of taking care of the products of combustion from the top burners. I don't exactly see how you would be able to carry off the poisonous fumes in any other way. The oven might be taken care of but not the top burners.

Mr. Waring—Mr. Grey, why is the blue flame more preferable in a gas heater than the luminous flame?

Mr. Grey—Only from the fact that the luminous flame does not always give complete combustion in some heaters.

Mr. Vincent—I am sorry to take exception to what Mr. Grey said, but I do not think that is entirely true. I think for the small, open radiators, for use in heating rooms temporarily, the open flame is preferable to the non-luminous, because the combustion is complete in a luminous flame just the same as it is in the non-luminous. Also the luminous flame *radiates* more heat than the non-luminous. In other words, if you take a luminous flame on an ordinary Bunsen burner, hanging a thermometer at a fixed distance from it, then, using the same amount of gas, make the flame non-luminous, the mercury in the thermometer will fall although the same amount of gas is being used. I think we have lost sight of some of the salient features brought out in this paper. Given an ordinary room, such as we have in the common dwelling house, without any special ventilation, just the ordinary, porous walls and the cracks in the doors and windows, and put a given number of human beings in it, the air will become vitiated in a short time. Light that room with electric lights and the length of time required for vitiation remains practically the same; light it with gas and the length of time is very much increased. In other words, lighting a room with gas makes it habitable very much longer than with any other form of illumination.

Mr. Waring—Mr. Grey recommends putting the ventilator in the top of the room. I think his paper is the highest technical paper that has been read to this Association up to this time, but I do disagree with him on that point. If you put an outlet in the top of your room you will certainly short-circuit your hot air and will not heat your room. If you put it in the bottom, as is done now, Mr. Grey's theory about circulation is all wrong. This will no doubt apply in audience halls, where you can diffuse the heat all over the floor, but in a residence I don't at all agree with Mr. Grey.

Mr. Grey—In order to get any ventilating effect or aid from the

gas burner it is necessary to have the ventilators placed at the top of the room, where they can take advantage of the heated currents of air passing up from the gas burners. The architects at the present time, as I said, do not take into account gas lighting as an aid to ventilation. I have not made a test of that proposition personally, but I have given a list of authorities at the close of my paper, and if read up they will furnish facts to justify the statement that you could heat rooms sufficiently that way.

Mr. Taylor—Because Mr. Grey has recommended the use of a ventilator at the top of the room, that does not necessarily cut out the use of a ventilator at the bottom. The architect is the one who should so proportion the openings that are placed that they will take care of the vitiated products properly without interfering with the heating of the room. For instance, the ventilator at the top can be made small and the one at the bottom larger, in which way a balance can be obtained that will give the best kind of results. Another little point. I find a great many people have erroneous ideas regarding soiled ceilings being caused by burning gas jets, and they seem to conclude that this is caused by the carbon in the unconsumed gas. As a matter of fact I don't believe that is so, but that it is due to the dust floating in the atmosphere of the room being carried up by the currents of air spoken of by Mr. Grey. The mere fact of this dust accumulating there tends to prove that they do carry up, and soiling the ceilings is one thing that the gas should not be blamed for. If the rooms were kept clean enough, it would not happen.

Mr. Martin - How is this greasy matter which is deposited accounted for? In trying to clean that off I found there was a kind of creosote underneath the dirt.

Mr. Grey—It is a combination of the dust particles and any organic matter not consumed by the heat of the gas flame.

Mr. Martin—Is it due to the composition of the gas in any way?

Mr. Waring—The same thing will be noticed on the back of a steam radiator, where absolutely nothing comes from the radiator except heat, and also on incandescent lights where they are near the ceiling. It is merely a current of warm air rising and impinging this dust and other foreign substance already in the room.

Mr. Averill—I can state from my own experience that Mr. Waring would be perfectly safe in recommending an architect to put ventilators in the top of a room. I ventilate the second floor of my house by ventilators in the side walls in the closets of the bedrooms that are about 7 feet from the floor. They are all boxed in. There is a ventilator in every clothes closet, linen closet, etc. They are all boxed together and carried in one pipe up through the roof. The first floor is ventilated through the fireplaces only. I have lived in this house 1½ years, and the ventilation is very good indeed.

The President—How did you come to design that method of ventilation?

Mr. Averill—I have been connected with a furnace company for about 5 or 6 years, and got these ideas from the man who was the ventilating engineer in that business. I had had that idea in mind for some time and carried it out as soon as I had an opportunity to build a house after my own ideas. I took this matter up with a Chicago architect, and he saw no objection to my system of ventilation. Tobacco smoke is cleared out in any room in the house by the time we get through smoking.

Mr. Waring—I would like to ask Mr. Averill how many tons of coal he burned last winter?

Mr. Averill—I burned coke in a special coke-burning boiler. The house is heated with hot water and has automatic regulation, and I used about a ton of coke to a room during the year.

Mr. Waring—As I understand Mr. Averill, then, he doesn't heat with a hot air furnace at all. I spoke of a hot air furnace short-circuited, going from the bottom right up to the outlet. It is not a parallel case at all.

Mr. Forest—I think I can get directly to the point that Mr. Waring brings up. I have been somewhat interested in the installation of hot water heating plants, and am not at all in favor of furnaces or hot air heating plants. However, in our town one of the most economically heated houses has a hot air plant. It is ventilated with ventilators in or near the ceiling in the side walls. For my own information I asked the owner if he did not think he was wasting a great deal of fuel and that his heat was going directly up. He said he thought not. So, one of the coldest days last winter, when I knew he would have sufficient fire to give it an ample test, I asked for an invitation to inspect his house, which he gladly granted. In order to know exactly how the circulation worked, we took along a little bag of feathers. There is more or less direct current to the ventilator, but probably not more than 10 per cent. of the feathers released went directly to the ventilator; the balance circulated around, up and over to the extreme outside of the room opposite to where the ventilator was installed, and opposite to where the hot air furnace register was in the floor, showing very plainly that the air was circulating in all parts of the room. I understand some of the men selling hot air furnaces recommend in their installation that the cold air draft and the hot air register be placed side-by-side, joining together—almost in the same register, you might say. If that is true there must certainly be some reason for it. A great many installations are being made in that manner at the present time and are said to be very satisfactory.

Mr. Waring—I don't think there is any danger of short circuit where both are at the bottom of the room, because the hot air will go in preference to going out there. I think Mr. Taylor's suggestion answers my question best in regard to properly proportioning that outlet. I believe if you make it so small that you will have what you might call a back pressure in the room, you will then get the circulation; but if you allow the average furnace man to put in your outlets, he will put the same outlet in for the bathroom as he will in the living room. This must be calculated carefully, and the outlet made so small that you will get a back pressure. In Mr. Forest's case I think there must have been a very small outlet, comparatively speaking, where he had a circulation as in a gasholder.

The President—I know the action you speak of in a gasholder, but we haven't any evidence that there is any short circuiting between the connections. While you may get a short circuit from the floor to the ceiling if you ventilate in that way, it will only be a small percentage of your air, because air is different from water in that expansion and contraction, and difference in temperature will have a very much greater influence on it than it will on a liquid like water, or in passing a solid material through the two openings. The air enters the room and is diffused around it very much more than I think you would imagine at first thought. If you try smoking in a room over the register, you will see that the air is circulated over the room and does not tend to short circuit entirely, although it may and probably does so more or less.

Mr. Vincent—This subject of ventilation is extremely interesting, but we are going to deal with one ventilated dwelling where we deal with a hundred that are not ventilated, and, therefore, we ought not to lose sight of the fact that in these unventilated rooms gas lighting will largely prevent the vitiation of the air. We would be very glad to have architects design ventilators that would improve the atmosphere, but I doubt very much whether it can be done in a very large percentage of small dwellings, and if we can impress upon architects the fact that gas lighting will improve the ventilation of the room (which we are sure of), we will accomplish a great deal.

Upon motion, a vote of thanks was extended to Mr. Grey for his paper. The convention thereupon adjourned to 10 o'clock A.M., the following day.

[To be Continued.]

[Continued from Page 142.]

FIRST ANNUAL MEETING, CANADIAN GAS ASSOCIATION.

Held in the King Edward Hotel, Toronto, June 26 and 27, 1908.

First Day—Morning Session.

The President introduced Mr. John Keillor, of Hamilton, Ont., who read a paper on

BYE PRODUCTS OF THE GAS INDUSTRY.

How much do we get for our tar and ammonia? The proportion in which the by-products tar and ammonia contribute to the income of gas companies has undergone considerable change during the last quarter of a century. It was during this period that any income worth speaking of from this source began to appear on the balance sheet at all. In the very early days "secondary products" was a very apt designation given to residual tar and liquor. Not only were they disagreeable by-products in the manufacture of coal gas, which had to be removed at considerable expense, but they were a positive nuisance in the hands of the gas manufacturer, threatening to some extent to impede the rapid extension of the use of gas for illuminating and other purposes.

"*Secondary Products*" *Neglected.*—The pioneers of the gas in-

dustry were so intently engaged inventing and perfecting apparatus for the economical production of illuminating gas that little time was devoted to the investigation and practical development and disposal of the crude tar and liquor. It remained for a later-day school of gas engineers and chemists to investigate and discover the intrinsic value of the "secondary products," and to establish the manufacture of new products therefrom upon a practical and commercial basis.

The student of gas manufacture and by-product distillation who takes the trouble to review the historic period of the industry cannot but feel amazed at the very large extent to which an absolutely new chemical and engineering industry has grown up out of the hitherto despised and useless by-products of coal gas manufacture. This new industry, the talons of which are deeply rooted in the system of the gas industry and upon which it depends for its existence, has sprung up largely within the last quarter of a century simultaneously with the rapid development in the practice of coal gas manufacture.

History of Distillation of Gas Tar.—It is interesting to recall that gas tar was first distilled in England on a fairly large scale about the year 1835. In Germany it was first used in 1838 for making roofing felt, etc. At that time, however, only a comparatively small proportion of the total tar made was utilized for manufacturing purposes, and it was not until Hofmann and Mansfield had shown the presence of benzole in gas tar oil, in 1845, and Perkin discovered the first of the aniline colors in 1856, that the great change came which created demand for the "secondary products" of gas works. Since then the quantity of tar used for manufacturing purposes all the world over has increased in leaps and bounds. In like manner ammonia - the principal source of which is gas works' liquor—has become a valuable article of commerce and its uses have rapidly extended.

How much has the gas industry in Canada benefited by the development of this new off-shoot industry of coal gas manufacture? Are our tar and liquor still "secondary products" in the same sense as they were 25 years ago, or have we forged ahead in the matter of working up these products and improved our methods of marketing them to meet the new conditions which have grown up around us? Has the price received by gas companies in Canada for crude tar and liquor increased proportionately with the prices received by the distillers for manufactured products?

It is on such questions dealing with the commercial side of this department that I propose to make a few personal observations, believing that these might interest the members more at this time than a technical paper on the manufacture of commercial tar and ammonia products and probably bring out a better discussion.

Experiences of a Canadian Company.—I shall not weary you, therefore, going into the chemistry of the subject, or recount the advantages or economies of distilling tar and ammonia in gas works direct. That has already been done on many occasions by gas engineers belonging to other associations who work up their tar and liquor, and whose results and experiences as recorded on the pages of the various technical organs representing the gas industry, would well repay further study. My intention is rather to relate one or two experiences which led to our installing a plant in Hamilton to work up tar. At the same time I take the opportunity of bringing before you in tabulated form some statistics relating to prices received by 29 Companies in Canada for tar, etc., in 1907, the quantity of gas works' tar made and sold in the Dominion, the imports of Canada of tar and pitch, the exports of Canada of tar and pitch.

Through the courtesy of the managers of the various gas works I was able to compile Table No. 1, relating to "Tar made and sold and prices received, etc., by 28 Companies in Canada."

TABLE NO. 2.—*Imports and Exports of Canada Coal Tar and Pitch.*

Imports from Britain. Year.	Gallons.	Value.	Exports to Britain. Year.	Value.
1902	652,377	$26,873	1902	$200
1903	558,828	27,037	1903	215
1904	449,520	25,743	1904	29
1905	584,036	24,597	1905	—
1906	512,202	22,669	1906	1,595
Imports from U. S.			**Exports to U. S.**	
1902	1,119,614	$71,673	1902	$14,891
1903	467,323	34,326	1903	25,015
1904	1,481,507	96,855	1904	24,299
1905	2,140,511	125,452	1905	12,346
1906	2,282,485	131,959	1906	44,133
Imports from Other Countries.			**Exports to Other Countries.**	
1902	30	$5	1902	$938
1903	225	185	1903	12,400
1904	—	—	1904	3,427
1905	435	92	1905	16,300
1906	—	—	1906	51,749
Imports from All Countries.			**Exports to All Countries.**	
1902	1,772,021	$98,551	1902	$16,029
1903	1,026,376	61,551	1903	37,630
1904	1,931,027	122,598	1904	27,755
1905	2,724,982	150,141	1905	28,646
1906	2,794,687	154,628	1906	98,477
1907	2,990,395	162,098		

Big Decrease in Prices.—Table No. 2 gives the "Imports and exports of Canada of coal tar and pitch, from 1902 to 1907 inclusive." I shall not take up your time reading the tables. You may do this afterwards for yourselves - but summarized the information contained in Table 1 is as follows: Total gas works' tar made in Canada, approximately, 3,100,000 gallons. All companies with two exceptions report getting lower prices for tar than they did four or five years ago. The average price received by larger companies shows a de-

TABLE NO. 1—*Relating to Tar Made and Sold by 29 Companies.*—Questions and Answers.*

Works.	Crude Tar Made Gallons.	Do You Use Tar For Fuel?	Can You Readily Market Crude Tar?	Did You Find it Difficult to Dispose of Tar Last 2 or 3 Years?	Gallons Tar Sold Last Year.	Gallons Tar Not Sold Last Year.	Average Price Rec'd per Gal. Made. Cents.	Is Present Price Less Than 3 to 4 Years Ago?
1	3,000	no	no	yes	80	2,920	5	yes 40 per cent.
2	18,000	no	no	very	16,000	2,000	1.7	.....
3	30,000	no	no	no market	480	29,520	.4	yes
4	no record	no	no	yes	none	no record	....	.....
5	N. G.	did use 2 or 3 rds.	no	yes	.....	.....	....	.....
6	20,000	none	struggle	yes except for 75 cents	5,600	14,400	1.6	30 per cent.
7	no record	no	no	.....	none	.....	....	yes
8	wasted	none	none	.....	none	.....	....	yes
9	37,000	no	at times	very	16,000	21,000	1.3	yes
10	120,000	no	no	very difficult	40,000	80,000	1.2	50 per cent.
11	.....	no	no	yes	none	.....	....	yes
12	no record	no	no	yes	none	.....	....	yes
13	150,000	no	no	very difficult	150,000	.....	1.8	yes
14	6,000	no	no	very	1,000	5,000	.7	yes
15	126,000	no	no	not till now	60,000	66,000	1.3	yes
16	no record	no	no	no value	1,600	.....	....	.....
17	.....	.....	.....	.....	.....	.....	....	.....
18	8,500	none	fair market	no	6,000	2,500	10.5	.....
19	27,500	none	no	no demand	16,000	11,500	2.5	40 per cent.
20	54,000	no	yes	no	48,000	6,000	2.2	.....
21	no record	no	no	.....	none	.....	....	yes
22	1,013,000	no	whole output sold	yes	1,013,000	.....	1.9	33 per cent.
23	84,000	none	yes	no	84,000	.....	2.8	yes
24	30,000	yes	no	very	none	used for fuel	....	much less
25	1,100,000	no	no	very	600,000	500,000	1.9	10-15 per cent.
26	80,000	none	yes	not at reduced price	70,000	10,000	3.5	10 per cent.
27	49,000	no	yes	no	49,000	.....	3.8	same
28	100,000	no	contract	yes	100,000	.....	2.4	yes
29	8,000	none	yes	no	8,000	.....	9.5	expect it will drop

* Nos. 1 to 29 represent separate cities or towns.

crease of fully 33 per cent. Eight companies report "tar allowed to go to waste; no demand." Nine companies did not sell half of what they made. Only five companies report "tar easily disposed of during the last three years. All other producing companies report "great difficulty in marketing tar." The average price received per gallon made was slightly more than 1½ cents.

To my mind these results reveal a condition of things which does not exist in any country where there is not over-production of tar. They indicate plainly that, instead of the prices of crude tar increasing as did the market value of pitch and tarred felt, etc., during the past few years, the value of tar has greatly depreciated. What is the cause of this big slump in the value of the crude product? How has the price decreased so much in the last four or five years?

Keeping in view the substantial progress that has been made in the utilization of crude tar in Canada as in other countries, together with the knowledge we have acquired of the many ramifications of the business of tar distillation, does it not seem strange that gas companies should have to accept less for this product than they did five years ago? Keeping in view, too, the fact that the price of coal is subject to frequent change, and that higher prices have been received during the same period by tar distillers for refined tar, tarred felt, pitch, etc., is it not strange that the gas engineering profession should apparently be content with an arrangement for the disposal of their crude products which existed in the infancy of the industry. For do most of us who can sell our tar and liquor not sell it at so much per gallon, or per barrel, or per strength, without any reference to a sliding scale, quality, or method of test, in the same old-fashioned way as did our forefathers, who, unlike us, were unaware of the possibilities of working up or otherwise disposing of the "secondary products" more profitably. We pride ourselves, and that rightly, upon the importance and greatness of our industry—upon the progress made in methods of manufacturing and boosting the sale of gas. But can we pride ourselves upon the progress made in methods of handling and marketing residuals? I think not. Generally speaking, very little advance has been made by the gas industry in Canada in this department. Excepting two companies that now distil their own tar, so far as I can learn, all the others sell the products crude in bulk without even reference to sliding scale. If there are any gentlemen here who sell their crude products on a sliding scale basis I am sure the meeting will be very glad to have the benefit of their experience.

Difficult to Dispose of By-Products.—It may be that the need of modernizing the method of disposal of crude tar in many Canadian cities was not considered necessary because most gas companies were content to sell their whole output to tar distillers - an arrangement which was fairly satisfactory to those companies who enjoyed it as long as the tar distiller relieved them of their entire output and paid a good price. But this is not the case to-day. Gas companies no longer get a good price and very few of them get rid of their entire output. Many companies cannot sell tar and ammonia at all under present conditions. Their product is unsalable. Most of us now have surplus tar and the tar distillers won't buy it. Why? Personally, I think this question will stand searching inquiry, because we find they now import a large part of the raw tar and pitch from the United States and Britain, which unfortunately the government allows to come in free. This displaces the tar made by our respective companies and gluts the Canadian market - a very good reason why we find it so difficult to market our product, even at low prices. This condition should not exist, because if the government returns are right there is more gas tar and pitch used in the Dominion than the gas companies make collectively. Another, and equally good, reason is that a few years ago the guardians of the tar trade in Canada formed themselves into a ring and at once made up their minds to mulct the ageing parent gas industry. That they have succeeded in their efforts to do this is very apparent. Witness the low prices now obtainable for crude tar.

Business in the Hands of a Combine.—The tar business has been absolutely in the hands of the tar combine during recent years. Have they not been in a position to dictate to the gas companies what price they would pay for crude tar? Prices which unfortunately the gas companies have accepted far too long. I am told this combination existed for the purpose of keeping the price of this product below par, and if this is true then it is apparent even to an outsider why we have had to accept lower prices. If the tar distillers had not been in combination, in all probability higher prices would have prevailed. The want of competing firms no doubt precipitated the slump. But whether there be competition or not I am afraid the results to gas companies will always be unsatisfactory, and year by year as we offer our raw product for sale without conditions the distiller will just as regularly dictate his price—knowing that it must be accepted. Why give him the chance? Truly the gas companies who sell their crude tar in bulk, without reference to sliding scale, or agreement under which they are relieved of their entire output, are in the hollow of the tar distiller's hand.

Large Quantities of American Tar Imported.—This was the position we found ourselves in in Hamilton, when our last contract expired fully 2 years ago. When the tar distillers came to us, wanting a renewal at a reduced price, we intimated that "we were not prepared to do this, that they must pay the same price as we were then receiving and moreover they must guarantee to take our whole output." This latter condition we did not think at all unreasonable because they formerly only took part of our output and we had great difficulty in marketing the balance. Moreover, it was known to us that a large quantity of American tar was being imported into Canada by the "Tar Combine," displacing Canadian tar, and that they could quite easily take care of our whole output—American tar being imported by the combine under the pretence that they could not manufacture their goods without it—which paraphrased means that Canadian tar was not suitable for manufacturing purposes (?)—a contention far too absurd to be taken serious notice of.

Our friends said that we were much too exacting, that the price of tarred felt and pitch did not warrant their paying such a big price for crude tar; that the quality was very inferior; and that they would not buy our whole output as they wished to be free to buy elsewhere. With not a single condition would they comply. I argued that as the price of coal had increased we were entitled to get a little more for tar and offered to sell the whole output on a sliding scale basis for 5 years, the variations in price to correspond with the rise and fall in the price of coal on the one hand and the price of tarred felt, pitch, refined tar, etc., on the other (an arrangement which I think should be more generally adopted), pointing out that the conditions as they were at the time were all in favor of the buyer and against the seller. They admitted the fairness of this proposition, but would not depart from the older fashioned method of buying on their own terms. They renewed the offer on this basis at a reduced price. We refused it.

A System which was Found Satisfactory.—A short time later we decided to adopt a system which the writer had previously tried and found successful. We installed a complete, new plant for distilling and refining tar and for manufacturing tarred felt, etc. It has now been running for about 8 months and I want to tell you, gentlemen, that it is the panacea for all the ills that are likely to arise between the avaricious tar distiller and the gas company. Since we installed the plant we have had absolute control of our tar output, regulating the working of it to suit the requirements of the works, and the price of the product to suit the price of coal and other commodities. Such a plant can be operated very cheaply in conjunction with a gas plant, because such charges as cartage and freight on crude tar, rent, management, etc., are altogether eliminated—besides, the cost of steam, taxes, interest, etc., are smaller proportionately. This enables you to work up the tar very economically and make it more valuable. Of course, it means some more work and responsibility for the gas manager, but it is a mighty good thing for his company.

We found some difficulty at first in marketing the manufactured goods on account of the same tar combine (who ran down the price of tar) having the hardware and roofing trade all tied up. A few months ago, however, this austere body was broken and now our products find a ready sale. At the present time we use our entire output of tar for saturating several grades of building paper and roofing felt, refining tar, and manufactured pitch, crude naphtha, light oil, creosote oil, crude carbolic acid, etc. Any gentlemen who has trouble in marketing his company's tar would do well to give this method of disposal his careful consideration. To my mind the results obtained by those who work up tar prove beyond doubt the desirability and economy of such a course. There is probably only one point on which those experienced in tar distilling have left us in doubt and that is "how small the gas works is where it will not pay to install plant for the working up of tar." Always taking into consideration, of course, the extent of the demand for crude products, and the difference between the market values of the crude and manufactured articles in a given district, it is obvious this is a matter for each individual to decide for himself according to local conditions, etc.

Assuming, however, that the gas industry is big enough in any town or district to warrant the erection of distilling plant, it seems to me only the natural sequel to a long series of chemical operations

carried on by the gas making industry that they should finish the work they begin with the destructive distillation of coal and work up residual tar and ammonia liquor to the best advantage themselves. This ideal may seem a little chimerical, but personally I am confident it is quite possible of attainment.

Canadian Imports and Exports of Tar.—I need not make more than a passing reference to Table No. 2, which shows the extent of the imports and exports of Canada of tar and pitch. With these figures some of you are already familiar. The imports in 1906 exceeded the exports by about $60,000. The value of the imports increased in 5 years by no less than 264 per cent. It was during this period that the value of tar to Canadian producers fell off. Gradually as the free importations increased the tar combine in Canada paid lower prices for Canadian-made tar.

Memorial Presented to the Government.—This Association recently presented a memorial to the government requesting that the duty be taken off gas coal and that a duty be imposed on foreign tar and pitch. So far as I know the government have not yet assented to any change in the tariffs, and it is to be hoped that further efforts will be made to show the authorities how much in need the gas industry is of relief. That the Canadian gas companies, who pay some $90,000 a year for duty on imported coal, should not at least have fair protection for their tar, pitch and coke market (which products cost us more to produce than American companies), is to my mind a gross injustice to the industry.

I had hoped to have some statistical information to lay before you relating to ammonia, but owing to the meager information received from gas companies generally in response to inquiries, I am unable to do so.

Discussion.

Mr. Keillor—I might say this paper is really more on the selling of by-products than a technical discourse upon it. It was a long paper, and I hope did not worry you. In conclusion Mr. Keillor said: Perhaps some of the gentlemen who did not reply to the queries I made about ammonia may do so now. [Applause.]

The President—That very valuable and interesting paper is before you. We would like to hear comments from the members present. If we are to get the full benefit of these things we must ask questions to bring out discussion.

Mr. Carter—As I understand it the tar averaged 1½ cents a gallon in the sale for several years?

Mr. Keillor—That would seem to be the average for 1907, so far as the statistics I have got show; and the 29 companies really represent all the companies producing tar; there are several others that make water gas.

Mr. Carter—I am only the Chairman of the Commission of the Guelph Light and Power Company, and at the risk of showing my ignorance I want to make a few remarks. We had this difficulty. Last year we got $1.50 a barrel, or, as we reckoned, about 80 cents a barrel net. It came on this year, and we had tar, and as you are aware we have no provision for storing it, so we had to have it in barrels, and they would keep bursting, and it kept getting into our drains, and the city people were after us, so we had fun. It went on further, and finally we had an offer for $1.40 a barrel, to take the whole output. That would leave us somewhere a little over 70 cents, or, as we thought, about 1¼ cents a gallon. We found another plan. We started to burn it ourselves for the production of our electric light, and are able to pay $1 a barrel where we only got 80 cents. Our output was about 1,000 gallons for 4,100 to 4,200 tons of coal used in the gas works. We thought we could do better. The city of Guelph owns its electric light plant besides the gas plant. We had some 500 or 600 barrels of tar, and as the hot weather came on the end would go out of one of the barrels, so we started to burn it under one boiler. We put an old tank just above the boilers and it was in a very nice position. We could bring our 6 or 8 barrels of tar over, just roll them down to the tank, empty them and put a feed pipe on to the boiler. We had difficulty at first with regard to the coke. We tried to cover the grates, but finally we were tormented with a lot of breeze from the crushed coke, and didn't know what to do with it. By accident we covered the bars with that. We then tried the breeze and tar and we found it was good; it didn't burn up quickly and helped the combustion. At first we burned quite a bit of breeze and we only used one boiler. Our output of tar was about 3 barrels a day then, but we are using now 8 or 10 barrels, since the water has been very low under this one boiler, to produce our power and electric light. It rids us of the annoyance of trying to place the tar, and we are getting as I said 20 cents a barrel more. You large producers can bring in your tank cars and run it away, but the small producers, to the extent of 80,000 or 100,000 feet of gas a week, can't do that. That was our condition, and we find that we can get 20 cents per 1,000 more for 1,000 barrels. That is $200 more to the gas department, and we are going to save $100 to $200 on coal. I have no objection to reading to you how we figure it out. We had 1,000 barrels of tar last year, $1,000; the time for handling, $50; teaming, $62.50; maintenance to plant, $10; interest on money, etc., $17.50. I have no hesitation in telling you we would save $200 to the gas department. Then we took the other for coal. We found a large quantity at $1.16, 40 gallons in the barrel; 2½ cents it stood us; that was to the works. This also effects a saving in coal that we have bought for the electric light plant; 1,000 barrels of tar equals 5,000 tons; 250 tons of coal, $1,001.50; teaming, etc., 25 cents a ton, or $1,068; then we get rid of our breeze, and now we are finding every day it is far easier and far more profitable to us to use the tar up in that way. I would like Mr. Keillor to say whether that is profitable. Should we really get much more for the value of the tar than 3½ cents a gallon?

Mr. Keillor—I think, Mr. Carter, we should get more than 3½ cents, but we can't get it. You mentioned you get a price of $1.40. Was that delivered at a certain place?

Mr. Carter—That was $1.40 delivered, with all the expenses.

Mr. Keillor—How much do you figure the expenses are?

Mr. Carter—6,000 pounds of freight at 7 cents, $42; freight on empty barrels, $71.40; loading, $45; unloading, $25; pumping and handling, $100; interest on money invested in barrels, $24.50; depreciation, $14.10. That depreciation charge I think would not now cover it.

Mr. Keillor—That last offer you got that you refused was lower than you previously got?

Mr. Carter—Instead of us getting $800 for our 1,000 barrels we would have obtained a little over $700.

Mr. Keillor—That seems the experience of all gas companies. Our price went down and down the last few years and we had to take some action to make our tar more valuable. As a matter of fact, last year we wouldn't net two cents a gallon and all expenses paid, whereas five or six years ago we could net about eight cents selling crude to tar distillers. Doesn't that seem strange at a time when the manufactured products have increased in value. The tables show that is the condition all around, and it seems strange to me such should be the case at a time when importations exceed really what we make altogether collectively in the country, showing the necessity for a duty to be put upon imported tar or pitch from the States or Britain. Just the other day I heard from a reliable source they were importing pitch from Britain, which really means the freight would be next to nothing from Liverpool or Glasgow to Montreal. The product being cheaper in Britain than it is here is what keeps down the price. They get lots of manufactured pitch in Montreal at $9 a ton, so that it keeps down the price of the manufactured pitch. With regard to your question about fuel, Mr. Carter, I might say we burned tar under our producer or retort benches for about six or eight months previous to our selling the plant. That I think is a question for each individual to decide, whether it is profitable in the end to burn tar or not. I think your figures of 2½ to 3 cents a gallon consuming it as a fuel would be very much the same as other experience in that line.

Mr. Carter—We have arranged it automatically.

Mr. Keillor—We had a steam injector operated by power, and, while it worked very satisfactorily, I discarded it; it was my opinion personally that our benches were being destroyed by it. If that is the case, and it is left in the hands of a few not very intelligent stokers, damage will be done; and if you allow something for additional depreciation in the benches, you have another charge.

Mr. Carter—Ours is under the boiler.

Mr. Keillor—I have had no experience of burning tar under a boiler. I believe Mr. Philip did, though.

Mr. Carter—How does the value of your tar stand now under your distilling?

Mr. Keillor—We have not had a complete year's working of the plant yet, or a complete year's return upon it; but at the very lowest estimate I should say it would be worth about 8 cents.

Mr. Carter—The next question is the size of the plant that you can put one of those in.

Mr. Keillor—There is the point in tar distillation; that is largely governed, I think, by local conditions. If you get a good price for your crude product then it might not pay in a small plant to manufacture tar products, but if you are getting next to nothing, as many

companies are virtually getting, your results must be very bad if you can't improve your revenue.

Mr. Hay—How would an Association plant work out?

Mr. Keillor—I am not prepared to say, but I think the idea of Mr. Powell and others to have central plants would be a capital idea and the only way out of the difficulty.

Mr. Elwin—Have you had any experience of gas tar in road building?

Mr. Keillor—Some. We are now endeavoring to get the City Council in Hamilton to purchase pitch for road making purposes; that is the residue you get after distilling the tar. Ordinary tar is used, too, in several places for sprinkling roads and painting roads. Just about a month ago I read a paper in the AMERICAN GAS LIGHT JOURNAL or "The Progressive Age," I forget which, giving detailed specifications of how they prepared and used it for painting and sprinkling roads.

Mr. Elwin—In Owen Sound we are trying to give them the tar to distribute on the street, but we can't even give it to the corporation. [Laughter.] They did, however, send the Road Commissioner to Hamilton to interview the head of the committee, and he came back with a long face.

The President—Regarding road work we have had some experience in Woodstock, and it is very satisfactory. Tar is very easily applied and makes a beautiful street and one thus far that is proving itself. It has been tested for a couple of years on one of the leading streets where heavy traffic from the depots go up, and thus far it looks like an asphalt pavement. The crushed rock was placed for three or four inches in depth on top of two inches of crushed rock, mixed with cold crude tar and rolled, over the top of which was the finer or the breeze of rock sprinkled and rolled, and it is as fine a street, Van Stittart street, as you want to look at. It is very satisfactory. People are highly delighted with it. We furnished them with the tar from the Woodstock plant and got a good price for it. We have also been using our tar for bench firing, getting three times as much in value for it as we could sell it for, and we have come to the conclusion it was very much less in cost than to use coke. We have been using it now for about three years for firing our benches side-by-side, the tar fired bench is altogether the easier to run, carrying the best and most regular heat, and it costs very much less to care for in repairs and regular attendance. This meeting being called for the purpose of the discussion of such subjects, I hope you are not going to let things go without taking definite action upon them as they come up seriatim. It has been the lack of being able to work in a concerted manner that has brought us together. It is because we have been ill-treated all around. We are accustomed to hear of hard lines and tribulation, but it is not in it with what we have had to stand. The coal used we are charged a duty on, and all the by-products we manufacture from it are admitted free of duty. Take again that which we have to compete with which is free—take anthracite coal—that is our great competitor for fuel; take our coke and free coke against that, then in regard to pitch and tar and all these things. We ought surely to get together because of community of interest and take definite action in regard thereto and devise some plan to help us out. I do not believe there is any better plan than that which we are adopting. To burn tar underneath our retorts and so on is virtually throwing the greatest value of the coal away, in my opinion. Look what is being done in other countries. It is amazing! Take Germany, the home of the greatest skill in regard to the production or utilizing of the by-products of gas on this earth. What was done there this last year? They, from coal tar, produced thirty million dollars worth of indigo and exported it. Not two millions were obtained in this whole Continent. Look along the line of by-products; they exported $200,000,000 worth of these. What are we doing here? We are throwing the gold away literally. Why shouldn't we have the same protection and the same facilities afforded us that others do? Why should we pay taxes upon our raw material? When we were at Ottawa the Minister said, "Well, putting a tax on these things is going to interfere with other manufacturers." We said, "Give us raw material free, take the duty off our coal and we will scrap them on the level; we will not ask any odds." But that does not give us the same opportunity others get. We have many gentlemen here in the commercial line, and we are glad to see you; we think we can get some help from you. The lower we can get our gas the more of your goods we can sell. From our by-products we don't get anything like what we ought to get per 1,000 feet of gas distilled. How many of you get 25 cents a 1,000 out of your by-products? Why shouldn't you get it? Wouldn't that help you on the price of your gas? And so in a good many lines. Take this matter I have mentioned in regard to our lighting. Why shouldn't we take up some means, if possible, of bringing about the manufacture of a self-lighting mantle? You know what a great thing that would be. We cannot do these things unless we take it up on regular lines with committees appointed to look into them, further them all the time and not let them drop. We will have these other things to fight one of these days. Take the matter of free alcohol. In Germany last year there were over 74,000,000 gallons of free alcohol used for manufacturing. How long is it going to be before you will get a mantle that will light without a match? If we don't move ahead other things will catch up to us, and we will be where we were before we got the mantle. We want to fight vigorously to get the value of our by-products and to work together in central plants, which I believe is the solution of it. And although, as Mr. Carter remarked, you may not have enough to send out in barrels, if we have central plants we can have tank cars, so you can send and get your tar in a tank car and have it manufactured. Take ammonia; there is no other country on the earth that should use as much of the sulphate of ammonia as this Province. Where have you more intelligent farmers? Where do they raise as much stuff that sells for as many dollars as in Canada? We want to fight the sulphuric acid fellows to get that down. There is a big combine; they ask three times as much in this country as in the old country to-day. These are lines we have to take up and fight for if we are going to maintain the supremacy we now have and increase our business and get the volume of business. These things are coming up rapidly. You will see the force of that when I tell you alcohol is being made for 10 cents a gallon and its equivalent in heat units is over half of gasoline, and for lighting it is double kerosine. I am making these remarks out of place, but I just wanted to impress this upon you. If any one thing induced me to take a hand in working this up it has been the feeling of the necessity for us getting together for our mutual benefit and protection, and we will not have accomplished what we ought to until we are manufacturing our own by-products. Look at the capital invested by the gas companies in this country. Do we lack capital? No. Senator Gibson tells me if it was advisable to go outside of the gas companies to get the money to put up these by-product plants he can get it quick as a flash. But of what use unless the gas companies are going to go in and take it up? That is where your principal interest lies. Take hold of it and help it along by interesting yourself in the building of a plant, and in that line of procedure. I am very glad Mr. Hay took up this matter of coal, for that is a very vital question. It is really amazing when we think of a lot of these things that we have been permitting so long. The public do not know this; they were all the time fighting for a lower price in gas, but how are we going to do these things unless we get them before the government? The people don't know it, and it is our duty to educate them. Take it all around, to-day probably 75 per cent. of the gas used is in incandescent mantles; it is not a matter of candle power. In the old country they are sending it out for heat units as we ought to do here. The open flame is not so much used as formerly. As to the pressure that gas is sent out on, is increased pressure with the mantle advisable? I think we could educate the people along all the lines so that we could sell very much more of our gas and very materially advance the interests of the companies in general if we will stand together. [Applause.]

Mr. Carter—I would like to move that this meeting recommend to the executive officers to still prosecute the efforts to persuade or prevail upon the government to take the duty off coal for gas making purposes. Do we want to go further than that? Is that where we are aiming, to either get the duty on by-products or the duty off coal?

Mr. Keillor—We want both.

Mr. Carter—Is it going through the minds of the larger purchasers of gas that that is possible for us, or are there to be distillers and a company formed or some arrangement made to use up these by-products ourselves, letting the companies go into a sliding scale on the profits or the price paid on the returns from the products? There are some of you at a disadvantage, but I don't think it would be difficult in our town, with our Commission, to get into selling our tar at 5 years and take the risk. Let it go the 5 or even 2 years, then let us get the returns after a fair amount of money has been paid on the investment. If there is none after that let us go without it; if money is made let us share it. Could we guarantee to supply it to any of these amalgamated companies, or could we have one for the whole Dominion? Wouldn't it be better from your information to have one or two plants?

Mr. Keillor—I think you could have two or three or four.

Mr. Carter—Supposing we had two or three or four in the district,

and let us agree for 5 years to let our tar go at $1.40 a barrel or even 1 cent a gallon—put it at the bottom—so as to be sure to be able to pay that; after paying 10 per cent. on the capital invested to allow for depreciation to outfit, and so on, let the returns be divided. It simplifies it. We could go into a 5 or 10-years' agreement. I think most of us could prevail on our Councils or Commissions to do that. I think something of this sort should be put forward so that we could achieve a result that is practical. I would like to move a resolution that we still prosecute our efforts to get a duty on by-products and the coal for gas free.

Mr. Philip - I second that. The tar question with us at Berlin was like a nightmare. We couldn't sell it. Our room around the tar well is limited; we had broken barrels and tar running around. You had to get a canal boat to get around. We have a storm drain discharging into a creek that runs down through the farming community and the farmers said we were poisoning the cattle, and grain wouldn't grow within half a mile of the creek, and God knows what all. A firm has now made arrangements with us to buy our tar in the well. They are putting up a small still on our property, we giving them a right to a contract for 5 years, they to give us 1¼ cents a gallon; we have nothing to do with the barrels or the trouble or nuisance or anything else around it; they will operate sufficient months in the year so that our storage capacity will take care of it during the time they do not operate. While we believe we are not getting near enough money for our tar, it is a perfect godsend to us under the conditions, because while we were not getting anything for the tar before, it was cotsing us from $300 to $500 a year getting barrels and handling it, and finally letting it run on the ground in the end; it is like a boy putting a pail under the tap and when it is full letting it run over on the ground, he might as well have let it run in the first place. As to burning tar, that is a questionable proceeding. You may burn tar under boilers and it may be very unsatisfactory; personally I wouldn't do it. You can burn tar and get good results, and it is a very nice system of firing, but finally the engineer gets the idea it is a little too good, and you are liable to get into trouble with it. I have no experience with burning tar under benches, but the general report you get on tar firing benches is not very satisfactory. From what I have read up on the subject, it burns out the lower retorts very much quicker than the upper ones. Mr. Powell's statement that the repairs to the benches were less, is, to say the least, out of the ordinary from the average statements. However, aside from burning tar under a boiler or bench, it ought to have more commercial value than the burning of it as a fuel. The distillation of coal tar in Germany, where my Dutch friends in Berlin come from, have carried the thing to almost the limits of refining and working up the coal tar into its various products. This country is growing, and the time will come when it will be done here; yet, as I understand it, a very large outlay of capital is needed to go into the refining of coal tar to the higher points, but the making of pitch and refining tar for the rubber and roofing trade are very simple processes, and if the gas manufacturers will either get together or get some good Samaritan to come along, as they did with us, and pay us for our tar in the well, it will certainly help a lot. I have much pleasure in seconding the motion.

The President—Mr. Philip, what you are doing is simply knocking the enterprise on the head.

Mr. Philip—No; it is the gas company that is doing it.

The President—If there is no combined action what is the use of putting up the plant? If they haven't got the raw material to work with, where are they going to get it unless from the companies? What is the nse of putting up your stills? Here is Mr. Keillor, he knows it now. He is making benzene and a dozen different things from this tar. I simply spoke a while ago to explain if this was carried the terms we could get it on. Mr. Norris knows in Montreal he can get every dollar that is wanted to put up a plant equal to any plant in the world if he can get the supply guaranteed. Gentlemen, make up your minds if you are going to do anything you have got to work together.

Mr. Forbes—We have 4 or 5 miles of tar road in Ottawa on our streets. I brought down one of the specifications to Mr. Keillor, and I will be very glad to let any of the members see it here. The distilling business is something new with us; we have only started in with pitch. We can find a ready market for all the pitch we can make this year. I don't think it is as profitable as saturating paper, but I think it will pay.

The President put Mr. Carter's motion, which, on vote, was declared carried. The President left the chair, and Vice-President Norris took the same.

Mr. Hay—I have a resolution here that I have been asked to read: Moved by Mr. E. J. Philip, seconded by Mr. Charles Forbes, that having heard the report of the action taken by the Canadian Retail Coal Dealers' Association, in the matter of short weights on coal in car lots, we, as an Association of gas manufacturers and large users of coal, approve of all the steps taken by the Retail Coal Dealers' Association in bringing this all-important question before the Railway Commission of Canada; and with a view to giving our practical aid to this work we recommend the Executive of this Association do recognize this work by a grant of $50, to assist in the completion of it before the Railway Commission. While I am not any longer President of the Retail Coal Dealers' Association, I am still Chairman of the Committee for the prosecution of this work before the Railway Commission, and I think while the amount stated is not large and would not hurt this Association, it will show its goodwill, and I am sure, as far as the Retail Coal Dealers' Association is concerned, it will be much appreciated.

Mr. Norris put the motion, which, on a vote having been taken, was declared carried.

Mr. Carter moved, duly seconded, that the thanks of this convention be given to Mr. Keillor for his able paper on the subject of by-products.

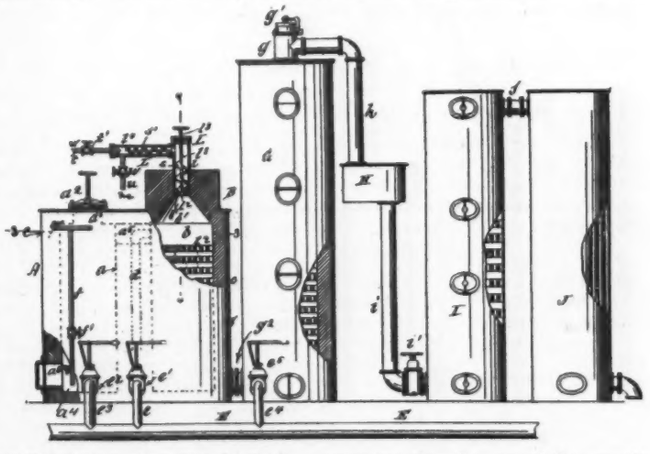
Mr. Norris put the motion, which, on a vote having been taken, was declared carried unanimously.

At 12:30 P.M., on motion, the convention adjourned to meet at 3:15 P.M.

(To be Continued.)

The Sutherland Improved Water Gas Apparatus.

On the 16th ult. U. S. Letters Patent were granted to Mr. A. M. Sutherland, of Orange, N. J., for an improvement in water gas apparatus. Using mainly the words of the specification the improvements relate to apparatus, and the invention consists in the special construction and arrangement of parts of the machinery described and claimed specifically. In the drawings, the figure is a diagrammatical veiw in



sectional elevation, in which the generator chamber a, of the cupola A, and the mixing and fixing chamber b, of the carburetter B, are formed in a common, continuous casing C of suitable refractory material incased in gastight covering c. In this casing C between the two said chambers is a conduit d, communicating at its upper end with the upper part of the carburetter chamber b, and at its lower extremity with the main air pipe E, through the medium of the branch pipe e, and the valve e^1.

The cupola is provided at the top with the usual fuel supply opening a^1, closed by a sealing cap a^2, and with the customary grate a^3, and ash pit a^4.

The usual provision is made for injecting steam into the incandescent fuel in the cupola, as by the pipe f, and valve f^1. Excepting that the cupola is incorporated in a single continuous casing C, of refractory material with the carburetter B, it is of ordinary and well known construction, and does not differ in function or operation from those heretofore used. The upper part of the generator chamber a communicates with the upper part of the carburetter chamber b, through a passage or flue a^5, just below the truncated conical concave dome b^1, of said carburetter chamber, and above the tiers of checkers or bricks of refractory material b^2, which are cross laid and spaced to form interstices for the tortuous passage of the gases in a manner well known.

Communicating with the ash pit a^4, of the cupola A, is an air valve e^3, interposed between it and the branch e^2, of the main air pipe E. Another branch air pipe e^4, and another valve e^5, connect the main air pipe E, with the lower part of a superheater G of any desired or

well known construction, provided at top with the usual relief pipe g, and cap g^1. This superheater G communicates near its base with the lower part of the carburetter B through the conduit g^2, the pipe g being in turn connected by the pipe h with the washer H, which is connected by the conduit i, and valve i^1, with the scrubber I, connected in turn by the pipe j, with the condenser J - said superheater G, washer H, scrubber I and condenser J, forming, however, no part of the present invention.

Provision is made for injecting steam vaporized hydrocarbon into the upper part of the carburetter chamber b, and for this purpose the specific form of injector and atomizer L, herein shown, or one essentially like it, in which the steam and hydrocarbon are caused to traverse a spiral passage which insures their intimate admixture and the reduction or separation of the liquid hydrocarbon into molecular form in such manner that the steam becomes to all intents and purposes impregnated and surcharged with hydrocarbon in a nascent state so that it will immediately combine with the water gas—when mixed with said gas in the upper part of the carburetter chamber b the steam enveloping the molecules of hydrocarbon and protecting them against carbonization before their chemical combination with the hydrogen.

The spiral course of the vaporized hydrocarbon and steam is made to traverse through the atomizer to impart to the blast injected into the carburetter a gyratory movement which is most effective in quickly causing the thorough admixture and union of the several gases preparatory to their descent through the checkerwork b^2. This gyratory movement is enhanced by making the top or dome b^1, of the of the mixing and fixing chamber b, of truncated concave conical form, so as to guide and confine the blast axially around the center of the chamber and cause the steam saturated hydrocarbon vapor to be precipitated directly into the water gas in the upper portion of the chamber b, so that all the gases are thoroughly agitated and stirred together to facilitate and expedite chemical reaction.

In the construction of atomizer L, l is a vertical cylindrical chamber the bottom of which fits the truncated opening in the concave conical dome b^1, of the mixing and fixing chamber b, so that both of said chambers are in axial alignment, since the mixing and fixing chamber b, is also preferably vertical and of cylindrical shape.

The lower end of the tubular chamber l, is formed with a central valve seat l^1, into which fits a needle or conical valve l^2, on the end of the adjustable valve rod l^3, so that said valve l^2, may be regulated accurately and delicately in position with relation to its seat l^1. Above the valve seat l^1, is arranged a spiral or auger-shaped member s, which may be attached directly to the valve rod l^3—the valve itself forming the end or apex of the auger-shaped member s, although this is not essential, since the spiral partition may be otherwise disposed, the lower extremity of the rod terminating in the valve seat l^1—the main and distinguishing feature of construction in this respect being a spiral passage leading to said conical valve seat, so that the bl st of vaporized hydrocarbon and steam will acquire and maintain a gyratory movement even after the passage through said valve seat l^1. It is to be understood that the main convolutions of the spiral member s fit the inner side walls of the cylindrical chamber l.

The liquid hydrocarbon and the steam under pressure may obviously be introduced directly into this tubular injector chamber l, if desired, but the inventor prefers in most cases to introduce the hydrocarbon and steam through a lateral or auxiliary chamber l^4, in which is another spiral member s^1, creating a spiral passage through which the liquid hydrocarbon and steam under pressure must pass on the way to the injector tube l—the enforced contact with the convolutions of the spiral member s^1, insuring the complete disintegration and atomizing of the hydrocarbon and the impregnation of the steam therewith prior to the entrance of the admixture into said injector tube l; t, represents a tube and t^1 a valve for controlling the supply of steam to the atomizer L, and u a tube, and u^1 a valve for controlling the supply of liquid hydrocarbon thereto.

In practice the preliminary heating of the parts is effected in substantially the same manner as heretofore. The supply of hydrocarbon and steam having been cut off, and the generating chamber having been charged with fuel and sealed, the cap g^1, at the top of the superheater G is opened and air under pressure is admitted to the ash pit a^1, through the valve e^3, to effect combustion of the fuel in the cupola A. Air is also admitted through the valve e^1 to the air conduit d, in the casing C, as well as through the valve e^4, to the superheater G, to oxidize the products of combustion passing over from the fuel in the cupola A.

When the several parts have been raised to the requisite degree of temperature and the fuel in the cupola rendered incandescent, the air supply is cut off and the cap g^1 closed, when steam is admitted to and through the incandescent fuel by the valve f^1 and pipe f, or equivalent means, the water gas generated by the decomposition of the steam passing through the fuel a^5, where it is met by the gyratory blast of vaporized hydrocarbon and steam admitted to the mixing and fixing chamber b, by the opening of the valve l^3, as hereinbefore set forth.

By forming the air conduit d, within the casing C, and between the generating chamber a and the mixing and fixing chamber b, I not only effect a saving in floor space, but I also heat the air before its admission into the chamber b during the preliminary heating process, thereby promoting the oxidation of the products of combustion entering through the flue a^4, preventing the chilling of the checkerwork b^2, and effecting economy by the utilization of otherwise waste heat. The including of the carburetter within the same casing and shell as the cupola is also of importance, in that the excess of heat radiating from the generator chamber a, as heretofore constructed, is utilized largely in effecting and maintaining the temperature of the carburetter.

Items of Interest
FROM VARIOUS LOCALITIES.

THE payment to the city authorities of 3 per cent. by the Lansing (Mich.) Gas Light Company, on account of franchise tax for the first 6 months of 1908, amounted to $1,893.76.

AT the annual meeting of the Watertown (S. D.) Gas Company the reports showed a sendout of 9,250,000 feet for the twelvemonth, and that the consumers numbered 346—the Company started in business in 1906. The officers elected were: President, M. R. Baskerville; Vice-President, H. A. Park; Secretary and Treasurer, H. D. Fletcher.

SOME months ago Mr. Thos. D. Miller, who wisely manages the affairs of the New Orleans Gas Light Company, was conversing with Mr. P. Jung, Jr., the Secretary and Treasurer of the Crescent Bed Company, of that city. In the order of the conversation Mr. Jung mentioned that they were having trouble with the open fire method in use for baking the enamel, whereupon Mr. Miller remarked that if the Crescent folks would bake with gas their troubles would be at an end. Mr. Jung was skeptical, but Mr. Miller was persistent. The latter finally prevailed and was told to go ahead and equip the factory with the necessary appliances. He did so, and some weeks afterwards—to be precise, July 3—Mr. Miller received the following communication from the bed makers: "Mr. T. D. Miller, etc.—We take pleasure in advising that the gas heating appliances installed in our four baking ovens, the approximate size of each of these ovens being 13 feet wide, 26 feet long and 9 feet high, are giving us entire satisfaction, and the cost of the gas is very much less than we had ever anticipated. The savings that we have made by the reductions the insurance bureaus have made us in our rates, by taking out the boilers which we heretofore used for heating purposes, will more than cover the annual cost of your bills for gas, which means that we save on our insurance premiums. We also save the entire cost of the coal and of the engineers' time, which latter items have also amounted to more, by quite a sum, than your bills. We feel obligated to the Gas Company for the savings thus obtained for us by the installation of these heating apparatuses, and by helping us to get rid of the boiler and the dirty coal pile. We will gladly recommend gas heating for all time."

MR. PERCY STEPHENSON, Special Master in the conjoint suits of Fred. C. Marston and the Columbia Trust Company, has filed his report, which is accompanied by a schedule of the property. In the report the Master says: "The defendant Company[1] had executed, prior to institution of this suit, a mortgage heretofore filed herein, securing $125,000 five per cent. coupon gold bonds. This mortgage is a valid lien upon the property, subject only to priority of claims of $741 of the George M. Clark division of the American Stove Company and $196.80 claimed by F. D. Moses."

NOTICE has been filed by the proprietors of the Terre Haute (Ind.) Gas Company of an extension of its life for a period of 50 years from July 15, 1908.

THE San Francisco Gas and Electric Company has made public the following rule in the future transaction of its business: "Please be advised that, according to the Company's rules, on and after July 1, 1908, there will be a rental charge of 50 cents a month for gas meters of 10-light size or under, when the registration does not exceed 50 cents, and $1 per month for meters larger than 10-light size when the monthly registration does not exceed $1."

AT the annual meeting of the Municipal Gas Company, of Albany, N. Y., the Directors elected were: A. N. Brady, R. C. Pruyn, Wm. McEwan, H. G. Young, John Bowe, J. A. Delehanty and E. B. Cantine.

MESSRS. STONE & WEBSTER have given notice of the declaration of a 5 per cent. semi-annual dividend of $5 per share on the capital stock of the Fall River (Mass.) Gas Works Company. It was made payable from the 1st inst.

ALL the preliminaries have been completed for the merging of the Home Light, Heat and Power Company, of Cleveland, O., with the Peoples Light, Heat and Power Company, of Cleveland. The merged corporation will begin with the seemingly ample capitalization of $1,000,000.

THE North Adams (Mass.) Gas Company has petitioned the Board of Gas and Electric Light Commissioners for the right to float a new bond issue in the sum of $100,000.

1. Suffolk, Va.

MR. ARTHUR H. KIMBALL, Superintendent of the Electrical Division of the business of the Fitchburg (Mass.) Gas and Electric Light Company, has resigned that post in order to take charge of the electric plant at Fall River.

WRITE to Board of Gas and Electric Light Commissioners, Boston, Mass., for a copy of its excellent pamphlet giving a resumé of all the measures enacted by the last legislature which in any way affect the Companies under its jurisdiction. There are 33 of these.

THE Oklahoma City Gas and Electric Company, has determined to have the work of service pipe laying in that city properly done, at least in so far as that is possible. In the past year or so indifferent work performed by local plumbers has so displeased the Company and its patrons as well, that it felt constrained to say to its customers, present and prospective: "In consideration of the fact that the Company itself is in reality compelled to maintain the service pipe it is considered but right that the Company should lay it. In consideration of the fact that the Company must suffer itself with the consumer, if this service pipe is improperly laid, the Company will do this same work for 20 cents a lineal foot, and will take the inspection fee off the hands of the consumer in addition. The Company feels that it is enabled to offer this as a business proposition, as its interests are mutual with those of the property owner in the way of perfect piping. Under no circumstances will the Company offer to do inside piping, nor will the Company lay any pipes beyond the meter, or supply any appliances. The desire of the Company is also so strong in the work for perfect piping, that a special inspector will be employed and paid by the Company, who will aid the city inspectors, who will pass on all piping between the mains and the meter before it is covered in the trench."

A CHAP who calls himself Joseph H. Misko, and who claims to be a chemist and an engineer—he certainly is a Polish Hebrew—succeeded in bamboozling a number of Catholic clergymen in this vicinity into investing money in a gas lamp with which the "inventor" is going to put the Welsbach Company out of business. He is now somewhere in the southwest, and as the game has proved profitable in this section it likely will not be long ere his "try" will again be made on similar lines. If he ever comes back to New York the recollection of his successful attacks on the priests and some of their monied friends will to a certainty move the dupes to putting him out business—for quite a while at least.

THE Gas Machinery Company, of Cleveland, Ohio, has been awarded the contract for sets of scrubbing and condensing apparatus sufficient to take care of the complete output of the West End Station of the Washington (D. C.) Gas Light Company. The latter Company is also laying a number of large feeder mains which will greatly improve on the equalizing of the pressure in its general distribution system.

MR. FRANK S. HASTINGS, President of the Indianapolis (Ind.) Gas Company, and Rear-Commodore of the Seawanhaka Yacht Club, has received from the Czar of Russia the emblem which denoted his membership in the Order of St. Stanislaus. The emblem which consists of a red and white ribbon twined around the Turkish cross, was pinned on the Captain's distended chest by Baron Schlippenback, the Russian Consul-General at New York, the ceremonial place being the deck of the Helenita, flag ship of the Seawanhaka Club, Commandant, Com. Frank J. Gould. The token, which is highly esteemed amongst the medal and ribbon seekers of the world, was awarded to the Rear Commodore in recognition of his services as President of the Russian Symphony Society, of New York.

WRITE to the General Gas Light Company, of Kalamazoo, Mich., for a copy of its latest circular, respecting the subject of "Tungsten Lamp Competition."

MR. C. N. SEIDENGLANZ, *l'Redacteur en Chef* of the business department of the Rockford (Ills.) Gas Light and Coke Company, invites every visiting gas man to hunt him up in his new headquarters in the reconstructed offices of the Company, corner of Wyman and Mulberry streets. The building is a beauty and its furnishing is beautiful—also, noteworthy is its adaptability to the every need of its patrons and its employees. The structure and its fittings stand for an expenditure of several thousands of dollars, but it is all warranted from the fact that the affair is really one of the attractions of the city. If old "Tom" Butterworth—blessed be his memory—could only view this changed condition, what would his ejaculation be!

THE "Utica Gas Office Team" has shown some shrinkage in the dimensions of its collective hatband since an encounter with the Utica City Hall team some days ago. However, the game was a close one—Office, 5; City Hall, 6—and perhaps the bands will again tightly bind their bonnets.

THE Eleventh Annual Meeting of the International Acetylene Association is set for the 10th, 11th and 12th insts., the meeting place being the Auditorium Hotel, Chicego, which hostelry has made quite favorable terms with the Association. The programme so far arranged contains 13 separate numbers, and the hintings as to the social side are to the end that a royal good time will be the portion of those who are to take part in it. Mr. A. C. Morrison is the Society's Secretary, and he is ready to reply to any queries that may be addressed to him respecting the convention. His office address is 157 Michigan avenue, Chicago.

BULLETIN No. 240, of the Western Gas Construction Company, has to do with holder construction. It is in keeping with the other gas works' construction literature issued from time to time from its press. The space calculations on its front page—giving diameter of space required for holders up to holding quantities from 1,000 cubic feet to 5,000,000 cubic feet—are well worth having on hand and held in a quickly get-at-able niche.

MR. V. R. MARSH is informed that the resolution filed by the Consolidated Gas Company with the New York Stock Exchange, under which holders are exchanging the 6 per cent. convertible debenture bonds for stock is as follows—the issue amounts to $20,000,000:

"*Resolved*, That the officers of this Company be and they are hereby authorized to issue the new stock of this Company in exchange for its 6 per cent. convertible debentures upon any date between now and January 1, 1909, at the rate of 1 share of stock for each $100 par value of debentures, and upon such exchange to pay to the debenture holder an amount in cash equal to the accrued interest upon such debenture to the date of such exchange, less interest upon the par value of the stock, issued to him at a rate corresponding with the rate per annum of the last previous dividend, calculated from the date of payment of such dividend."

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well known construction, provided at top with the usual relief pipe g, and cap g^1. This superheater G communicates near its base with the lower part of the carburetter B through the conduit g^3, the pipe g being in turn connected by the pipe h with the washer H, which is connected by the conduit i, and valve i^1, with the scrubber I, connected in turn by the pipe j, with the condenser J - said superheater G, washer H, scrubber I and condenser J, forming, however, no part of the present invention.

Provision is made for injecting steam vaporized hydrocarbon into the upper part of the carburetter chamber b, and for this purpose the specific form of injector and atomizer L, herein shown, or one essentially like it, in which the steam and hydrocarbon are caused to traverse a spiral passage which insures their intimate admixture and the reduction or separation of the liquid hydrocarbon into molecular form in such manner that the steam becomes to all intents and purposes impregnated and surcharged with hydrocarbon in a nascent state so that it will immediately combine with the water gas—when mixed with said gas in the upper part of the carburetter chamber b the steam enveloping the molecules of hydrocarbon and protecting them against carbonization before their chemical combination with the hydrogen.

The spiral course of the vaporized hydrocarbon and steam is made to traverse through the atomizer to impart to the blast injected into the carburetter a gyratory movement which is most effective in quickly causing the thorough admixture and union of the several gases preparatory to their descent through the checkerwork b^2. This gyratory movement is enhanced by making the top or dome b^1, of the of the mixing and fixing chamber b, of truncated concave conical form, so as to guide and confine the blast axially around the center of the chamber and cause the steam saturated hydrocarbon vapor to be precipitated directly into the water gas in the upper portion of the chamber b, so that all the gases are thoroughly agitated and stirred together to facilitate and expedite chemical reaction.

In the construction of atomizer L, l is a vertical cylindrical chamber the bottom of which fits the truncated opening in the concave conical dome b^1, of the mixing and fixing chamber b, so that both of said chambers are in axial alignment, since the mixing and fixing chamber b, is also preferably vertical and of cylindrical shape.

The lower end of the tubular chamber l, is formed with a central valve seat l^1, into which fits a needle or conical valve l^2, on the end of the adjustable valve rod l^3, so that said valve l^2, may be regulated accurately and delicately in position with relation to its seat l^1. Above the valve seat l^1, is arranged a spiral or auger-shaped member s, which may be attached directly to the valve rod l^3—the valve itself forming the end or apex of the auger-shaped member s, although this is not essential, since the spiral partition may be otherwise disposed, the lower extremity of the rod terminating in the valve seat l^1—the main and distinguishing feature of construction in this respect being a spiral passage leading to said conical valve seat, so that the bl st of vaporized hydrocarbon and steam will acquire and maintain a gyratory movement even after the passage through said valve seat l^1. It is to be understood that the main convolutions of the spiral member s fit the inner side walls of the cylindrical chamber l.

The liquid hydrocarbon and the steam under pressure may obviously be introduced directly into this tubular injector chamber l, if desired, but the inventor prefers in most cases to introduce the hydrocarbon and steam through a lateral or auxiliary chamber l^4, in which is another spiral member s^1, creating a spiral passage through which the liquid hydrocarbon and steam under pressure must pass on the way to the injector tube l—the enforced contact with the convolutions of the spiral member s^1, insuring the complete disintegration and atomizing of the hydrocarbon and the impregnation of the steam therewith prior to the entrance of the admixture into said injector tube l; t, represents a tube and t^1 a valve for controlling the supply of steam to the atomizer L, and u a tube, and u^1 a valve for controlling the supply of liquid hydrocarbon thereto.

In practice the preliminary heating of the parts is effected in substantially the same manner as heretofore. The supply of hydrocarbon and steam having been cut off, and the generating chamber having been charged with fuel and sealed, the cap g^1, at the top of the superheater G is opened and air under pressure is admitted to the ash pit a^1, through the valve e^2, to effect combustion of the fuel in the cupola A. Air is also admitted through the valve e^1 to the air conduit d, in the casing C, as well as through the valve e^3, to the superheater G, to oxidize the products of combustion passing over from the fuel in the cupola A.

When the several parts have been raised to the requisite degree of temperature and the fuel in the cupola rendered incandescent, the air supply is cut off and the cap g^1 closed, when steam is admitted to and through the incandescent fuel by the valve f^1 and pipe f, or equivalent means, the water gas generated by the decomposition of the steam passing through the fuel a^2, where it is met by the gyratory blast of vaporized hydrocarbon and steam admitted to the mixing and fixing chamber b, by the opening of the valve l^3, as hereinbefore set forth.

By forming the air conduit d, within the casing C, and between the generating chamber a and the mixing and fixing chamber b, I not only effect a saving in floor space, but I also heat the air before its admission into the chamber b during the preliminary heating process, thereby promoting the oxidation of the products of combustion entering through the flue a^4, preventing the chilling of the checkerwork b^2, and effecting economy by the utilization of otherwise waste heat. The including of the carburetter within the same casing and shell as the cupola is also of importance, in that the excess of heat radiating from the generator chamber a, as heretofore constructed, is utilized largely in effecting and maintaining the temperature of the carburetter.

Items of Interest
FROM VARIOUS LOCALITIES.

THE payment to the city authorities of 3 per cent. by the Lansing (Mich.) Gas Light Company, on account of franchise tax for the first 6 months of 1908, amounted to $1,893.76.

AT the annual meeting of the Watertown (S. D.) Gas Company the reports showed a sendout of 9,250,000 feet for the twelvemonth, and that the consumers numbered 346—the Company started in business in 1906. The officers elected were: President, M. R. Baskerville; Vice-President, H. A. Park; Secretary and Treasurer, H. D. Fletcher.

SOME months ago Mr. Thos. D. Miller, who wisely manages the affairs of the New Orleans Gas Light Company, was conversing with Mr. P. Jung, Jr., the Secretary and Treasurer of the Crescent Bed Company, of that city. In the order of the conversation Mr. Jung mentioned that they were having trouble with the open fire method in use for baking the enamel, whereupon Mr. Miller remarked that if the Crescent folks would bake with gas their troubles would be at an end. Mr. Jung was skeptical, but Mr. Miller was persistent. The latter finally prevailed and was told to go ahead and equip the factory with the necessary appliances. He did so, and some weeks afterwards—to be precise, July 3—Mr. Miller received the following communication from the bed makers: "Mr. T. D. Miller, etc.—We take pleasure in advising that the gas heating appliances installed in our four baking ovens, the approximate size of each of these ovens being 13 feet wide, 26 feet long and 9 feet high, are giving us entire satisfaction, and the cost of the gas is very much less than we had ever anticipated. The savings that we have made by the reductions the insurance bureaus have made us in our rates, by taking out the boilers which we heretofore used for heating purposes, will more than cover the annual cost of your bills for gas, which means that we save on our insurance premiums. We also save the entire cost of the coal and of the engineers' time, which latter items have also amounted to more, by quite a sum, than your bills. We feel obligated to the Gas Company for the savings thus obtained for us by the installation of these heating apparatuses, and by helping us to get rid of the boiler and the dirty coal pile. We will gladly recommend gas heating for all time."

MR. PERCY STEPHENSON, Special Master in the conjoint suits of Fred. C. Marston and the Columbia Trust Company, has filed his report, which is accompanied by a schedule of the property. In the report the Master says: "The defendant Company[1] had executed, prior to institution of this suit, a mortgage heretofore filed herein, securing $125,000 five per cent. coupon gold bonds. This mortgage is a valid lien upon the property, subject only to priority of claims of $741 of the George M. Clark division of the American Stove Company and $196.80 claimed by F. D. Moses."

NOTICE has been filed by the proprietors of the Terre Haute (Ind.) Gas Company of an extension of its life for a period of 50 years from July 15, 1908.

THE San Francisco Gas and Electric Company has made public the following rule in the future transaction of its business: "Please be advised that, according to the Company's rules, on and after July 1, 1908, there will be a rental charge of 50 cents a month for gas meters of 10-light size or under, when the registration does not exceed 50 cents, and $1 per month for meters larger than 10-light size when the monthly registration does not exceed $1."

AT the annual meeting of the Municipal Gas Company, of Albany, N. Y., the Directors elected were: A. N. Brady, R. C. Pruyn, Wm. McEwan, H. G. Young, John Bowe, J. A. Delehanty and E. B. Cantine.

MESSRS. STONE & WEBSTER have given notice of the declaration of a 5 per cent. semi-annual dividend of $5 per share on the capital stock of the Fall River (Mass.) Gas Works Company. It was made payable from the 1st inst.

ALL the preliminaries have been completed for the merging of the Home Light, Heat and Power Company, of Cleveland, O., with the Peoples Light, Heat and Power Company, of Cleveland. The merged corporation will begin with the seemingly ample capitalization of $1,000,000.

THE North Adams (Mass.) Gas Company has petitioned the Board of Gas and Electric Light Commissioners for the right to float a new bond issue in the sum of $100,000.

1. Suffolk, Va.

MR. ARTHUR H. KIMBALL, Superintendent of the Electrical Division of the business of the Fitchburg (Mass.) Gas and Electric Light Company, has resigned that post in order to take charge of the electric plant at Fall River.

WRITE to Board of Gas and Electric Light Commissioners, Boston, Mass., for a copy of its excellent pamphlet giving a resumé of all the measures enacted by the last legislature which in any way affect the Companies under its jurisdiction. There are 33 of these.

THE Oklahoma City Gas and Electric Company, has determined to have the work of service pipe laying in that city properly done, at least in so far as that is possible. In the past year or so indifferent work performed by local plumbers has so displeased the Company and its patrons as well, that it felt constrained to say to its customers, present and prospective: "In consideration of the fact that the Company itself is in reality compelled to maintain the service pipe it is considered but right that the Company should lay it. In consideration of the fact that the Company must suffer itself with the consumer, if this service pipe is improperly laid, the Company will do this same work for 20 cents a lineal foot, and will take the inspection fee off the hands of the consumer in addition. The Company feels that it is enabled to offer this as a business proposition, as its interests are mutual with those of the property owner in the way of perfect piping. Under no circumstances will the Company offer to do inside piping, nor will the Company lay any pipes beyond the meter, or supply any appliances. The desire of the Company is also so strong in the work for perfect piping, that a special inspector will be employed and paid by the Company, who will aid the city inspectors, who will pass on all piping between the mains and the meter before it is covered in the trench."

A CHAP who calls himself Joseph H. Misko, and who claims to be a chemist and an engineer—he certainly is a Polish Hebrew – succeeded in bamboozling a number of Catholic clergymen in this vicinity into investing money in a gas lamp with which the "inventor" is going to put the Welsbach Company out of business. He is now somewhere in the southwest, and as the game has proved profitable in this section it likely will not be long ere his "try" will again be made on similar lines. If he ever comes back to New York the recollection of his successful attacks on the priests and some of their monied friends will to a certainty move the dupes to putting him out business—for quite a while at least.

THE Gas Machinery Company, of Cleveland, Ohio, has been awarded the contract for sets of scrubbing and condensing apparatus sufficient to take care of the complete output of the West End Station of the Washington (D. C.) Gas Light Company. The latter Company is also laying a number of large feeder mains which will greatly improve on the equalizing of the pressure in its general distribution system.

MR. FRANK S. HASTINGS, President of the Indianapolis (Ind.) Gas Company, and Rear-Commodore of the Seawanhaka Yacht Club, has received from the Czar of Russia the emblem which denoted his membership in the Order of St. Stanislaus. The emblem which consists of a red and white ribbon twined around the Turkish cross, was pinned on the Captain's distended chest by Baron Schlippenback, the Russian Consul-General at New York, the ceremonial place being the deck of the Helenita, flag ship of the Seawanhaka Club, Commandant, Com. Frank J. Gould. The token, which is highly esteemed amongst the medal and ribbon seekers of the world, was awarded to the Rear Commodore in recognition of his services as President of the Russian Symphony Society, of New York.

WRITE to the General Gas Light Company, of Kalamazoo, Mich., for a copy of its latest circular, respecting the subject of "Tungsten Lamp Competition."

MR. C. N. SEIDENGLANZ, *l'Redacteur en Chef* of the business department of the Rockford (Ills.) Gas Light and Coke Company, invites every visiting gas man to hunt him up in his new headquarters in the reconstructed offices of the Company, corner of Wyman and Mulberry streets. The building is a beauty and its furnishing is beautiful—also, noteworthy is its adaptability to the every need of its patrons and its employees. The structure and its fittings stand for an expenditure of several thousands of dollars, but it is all warranted from the fact that the affair is really one of the attractions of the city. If old "Tom" Butterworth—blessed be his memory—could only view this changed condition, what would his ejaculation be!

THE "Utica Gas Office Team" has shown some shrinkage in the dimensions of its collective hatband since an encounter with the Utica City Hall team some days ago. However, the game was a close one—Office, 5; City Hall, 6—and perhaps the bands will again tightly bind their bonnets.

THE Eleventh Annual Meeting of the International Acetylene Association is set for the 10th, 11th and 12th insts., the meeting place being the Auditorium Hotel, Chicego, which hostelry has made quite favorable terms with the Association. The programme so far arranged contains 13 separate numbers, and the hintings as to the social side are to the end that a royal good time will be the portion of those who are to take part in it. Mr. A. C. Morrison is the Society's Secretary, and he is ready to reply to any queries that may be addressed to him respecting the convention. His office address is 157 Michigan avenue, Chicago.

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THE AMERICAN GAS LIGHT JOURNAL

A. M. CALLENDER & CO.,
PROPRIETORS.

MONDAY, AUGUST 3, 1908.

The Market for Gas Securities.

Consolidated held its own during the past week of eccentricity in values, and it will easily sell at 150 before the first prox. The noon quotation to-day (Friday) was 138½ to ¾. Our prediction as to the rise is based on the increase in net earnings. The stock conversion is going on calmly.

Brooklyn Union is 129 to 134, and without disparaging it, one might be forgiven for thinking that if Brooklyn is worth 129 Consolidated should be worth 175, at least. Peoples, of Chicago, holds well. A sensible move made by its management is the opening of a set of transfer books at its headquarters in Chicago. Massachusetts gas is 55 to 55½. It is worth 75, *per se*.

Gas Stocks.

Quotations by George W. Glese, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

AUGUST 3.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated Gas Co.	$73,177,000	100	138¼	138⅝
Central Union Gas Co.—				
1st 5's, due 1972, J. & J.	3,000,000	1,000	93	96½
Equitable Gas Light Co.—				
Con. 5's, due 1932, M. & S.	1,000,000	1,000	—	105
Mutual Gas Co.	3,500,000	100	130	160
New Amsterdam Gas Co.—				
1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	92	96
New York & Richmond Gas				
Co. (Staten Island)	1,500,000	100	37	43
1st Mtg. Gold Bds. 5 p. ct.	1,000,000	—	98	104
New York and East River—				
1st 5's, due 1944, J. & J.	3,500,000	1,000	100	105
Con. 5's, due 1945, J. & J.	1,500,000	—	97	101
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	90	98
Standard	5,000,000	100	70	100
Preferred	5,000,000	100	100	125
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	100	105
The Brooklyn Union	15,000,000	1,000	129	134
1st Con. 5's, due 1948, M. & N.	15,000,000	—	91½	92
Yonkers	200,650	500	120	—
Out-of-Town Companies.				
Bay State	50,000,000	50	1	1 1-16
" Income Bonds	2,000,000	1,000	—	75
Binghampton Gas Works	450,000	100	—	65
" 1st Mtg. 5's	500,000	1,000	95	100
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	5	8
" " Bonds, 5's	5,250,000	1,000	63	66
Capital, Sacramento	500,000	50	—	35
Bonds (6's)	150,000	1,000	—	—
Chicago Gas Co. Guaranteed				
Gold Bonds	7,000,000	1,000	104	105¼
Cincinnati Gas and Electric Co.	20,500,000	100	92½	93
Columbus (O.) Gas Co., 1st				
Mortgage Bonds	1,500,000	1,000	92	93
Columbus (O.) Gas Lt. &				
Heating Co.	1,082,750	100	87	88
Preferred	3,028,500	100	71	80
Consumers, Toronto	2,000,000	50	200	204
Consolidated, Baltimore	11,000,000	100	—	105
Mortgages, 6's	3,000,000	—	—	118
Chesapeake, 1st 6's	1,000,000	—	—	—
Equitable, 1st 6's	910,000	—	—	—
Consolidated, 1st 5's	1,490,000	—	—	112
Consolidated Gas Co. of N. J.	1,000,000	100	15	17
Con. Mtg. 5's	880,000	1,000	92	95
Bonds	75,000	—	—	100
Denver Gas and Electric	—	—	74½	75
Detroit City Gas Co.	6,000,000	50	—	50
" Prior Lien 5's	4,618,000	1,000	—	98
Detroit Gas Co., 5's	381,000	1,000	75	80
" Inc. 5's	16,000	100	98½	100
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	—	101
Essex and Hudson Gas Co.	6,500,000	—	39	40
Fort Wayne	2,000,000	—	—	—
" Bonds	2,000,000	—	55	—
Grand Rapids Gas Light Co., 1st Mtg. 5's	1,225,000	1,000	104½	105
Hartford	750,000	25	190	200
Hudson County Gas Co., of New Jersey	10,500,000	—	100	105
" Bonds, 5's	10,500,000	—	101	102½
Indianapolis	2,000,000	—	60	70
" Bonds, 5's	2,650,000	—	104¼	105
Jackson Gas Co.	250,000	50	82	—
" 1st Mtg. 5's	290,000	1,000	97	100
Kansas City Gas Light Co., of Missouri	5,000,000	100	—	36
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede Gas Co., St. Louis	10,000,000	100	—	100
Preferred	2,500,000	100	60	90
Bonds	10,000,000	1,000	104	104¼
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,370,000	50	143	145
Madison Gas and Electric Co.				
" 1st Mtg. 6's	350,000	1,000	106	108¾
" 6 per cent. scrip, due 1910	100,000	25	60	60½
Massachusetts Gas Companies, of Boston	25,000,000	100	55	55½
Preferred	25,000,000	100	87	87½
Montreal Gas Co., Canada	3,000,000	100	218	218¾
Nashville Gas Light Co.	1,000,000	100	110	—
Newark, N. J., Con. Gas Co.	6,000,000	—	56	58
Bonds, 6's	6,000,000	—	137	138
New Haven Gas Co.	2,000,000	25	200	—
Peoples Gas Lt. & Coke Co., Chicago	25,000,000	100	95½	96
1st Mortgage	20,100,000	1,000	—	—
2d "	2,500,000	1,000	104	—
Rochester Gas & Electric Co.	2,150,000	50	88	—
Preferred	2,150,000	50	118	—
Consolidated 5's	2,000,000	—	104½	105½
San Francisco Gas Co., Cal.	15,500,000	—	—	—
St. Joseph Gas Co.—				
1st Mtg. 5's	751,000	1,000	92	—
St. Paul Gas Light Co.	1,500,000	100	45	47
1st Mortgages, 6's	650,000	1,000	113	116
Extension, 6's	600,000	1,000	112½	115
General Mortgage, 5's	2,465,000	1,000	96¼	—
Syracuse Gas Co., N. Y.	1,975,000	100	50	55
Bonds	2,047,000	1,000	102	—
Washington (D. C.) Gas Co.	2,600,000	20	322½	335
1st Mortgage, 6's	600,000	—	—	—
Western Gas Co., Milwaukee	4,000,000	—	—	—
Wilmington (Del.) Gas Co.	600,000	50	230	—

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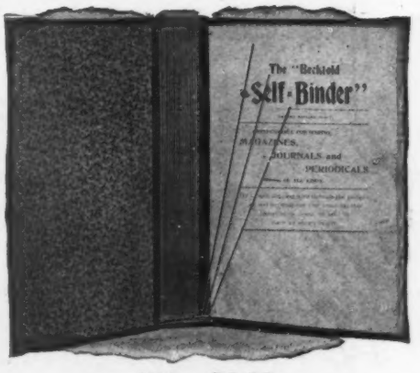

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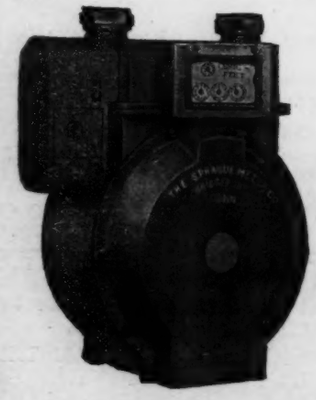

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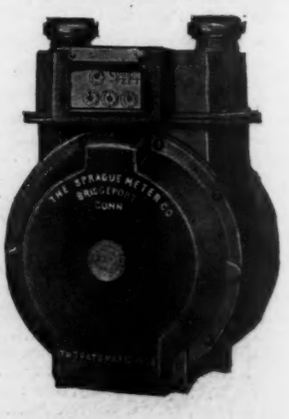

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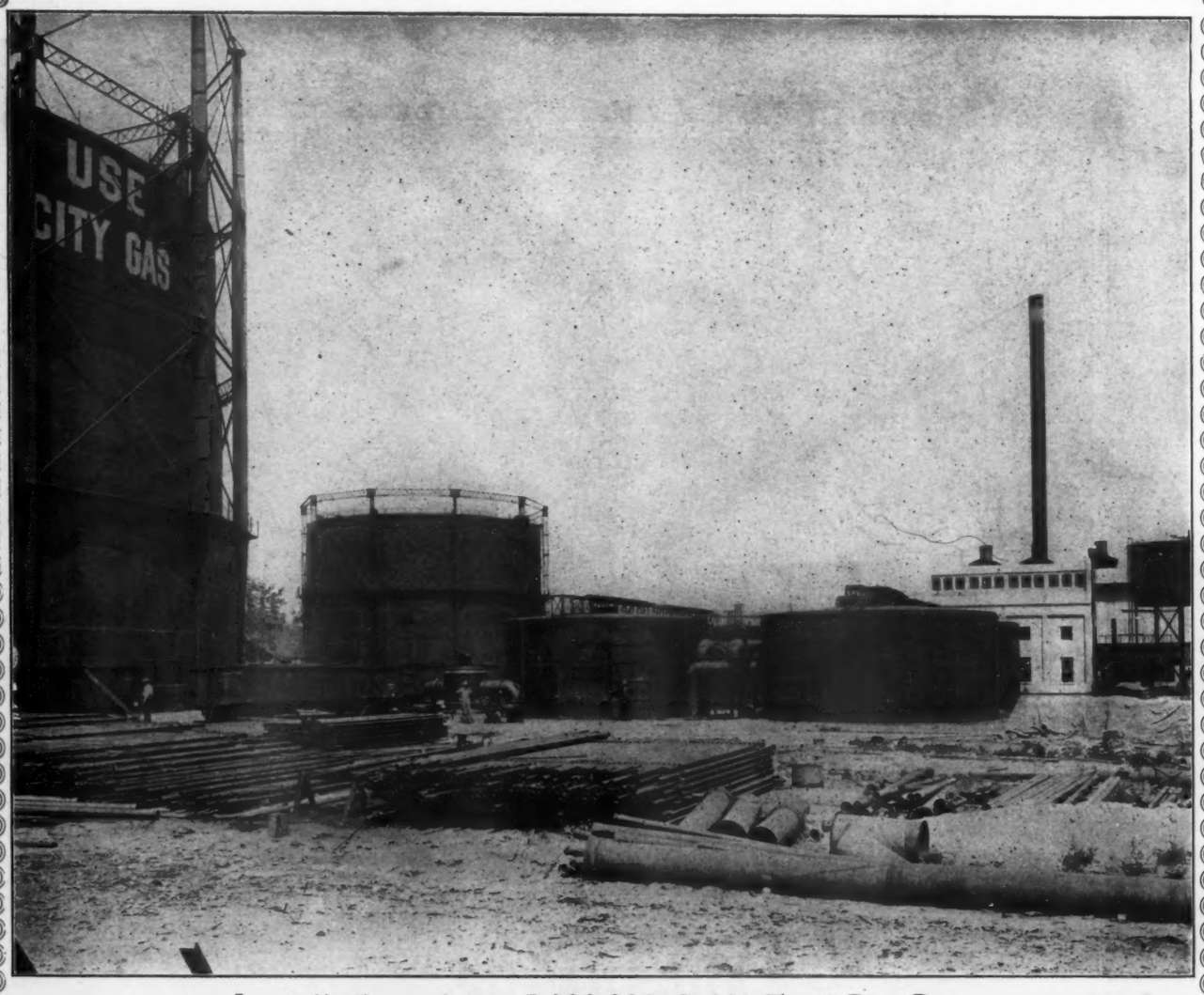

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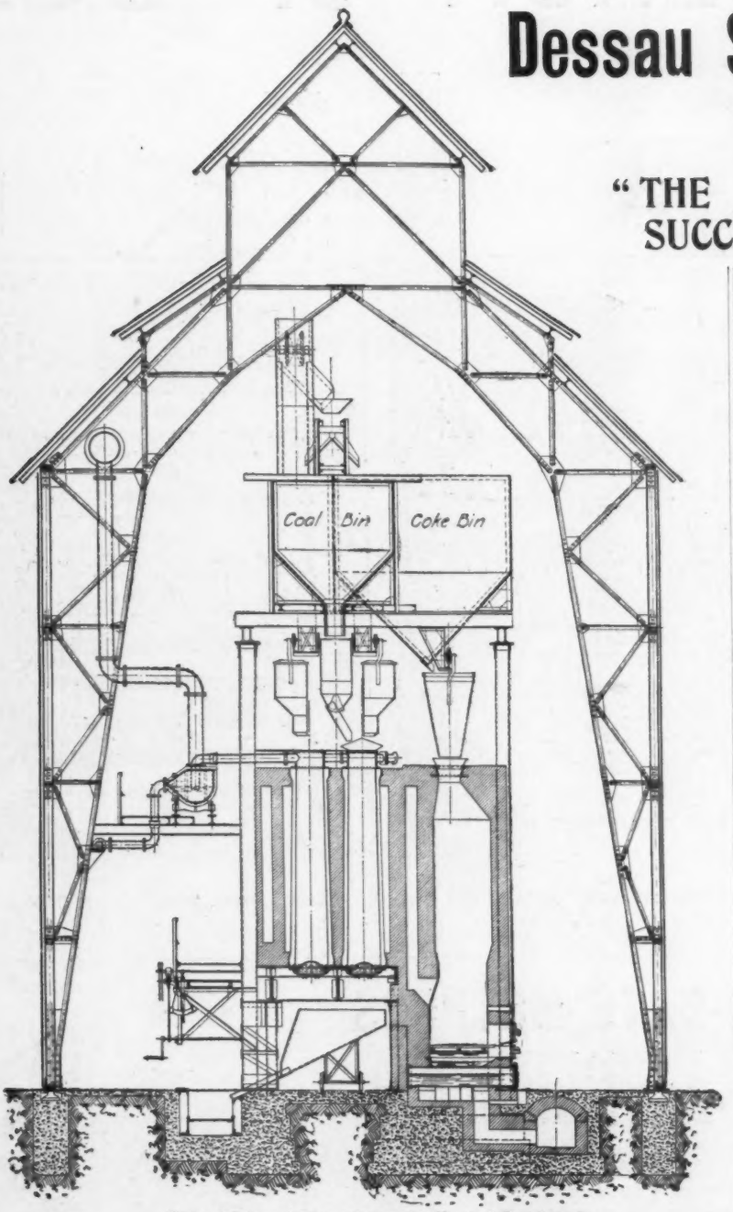

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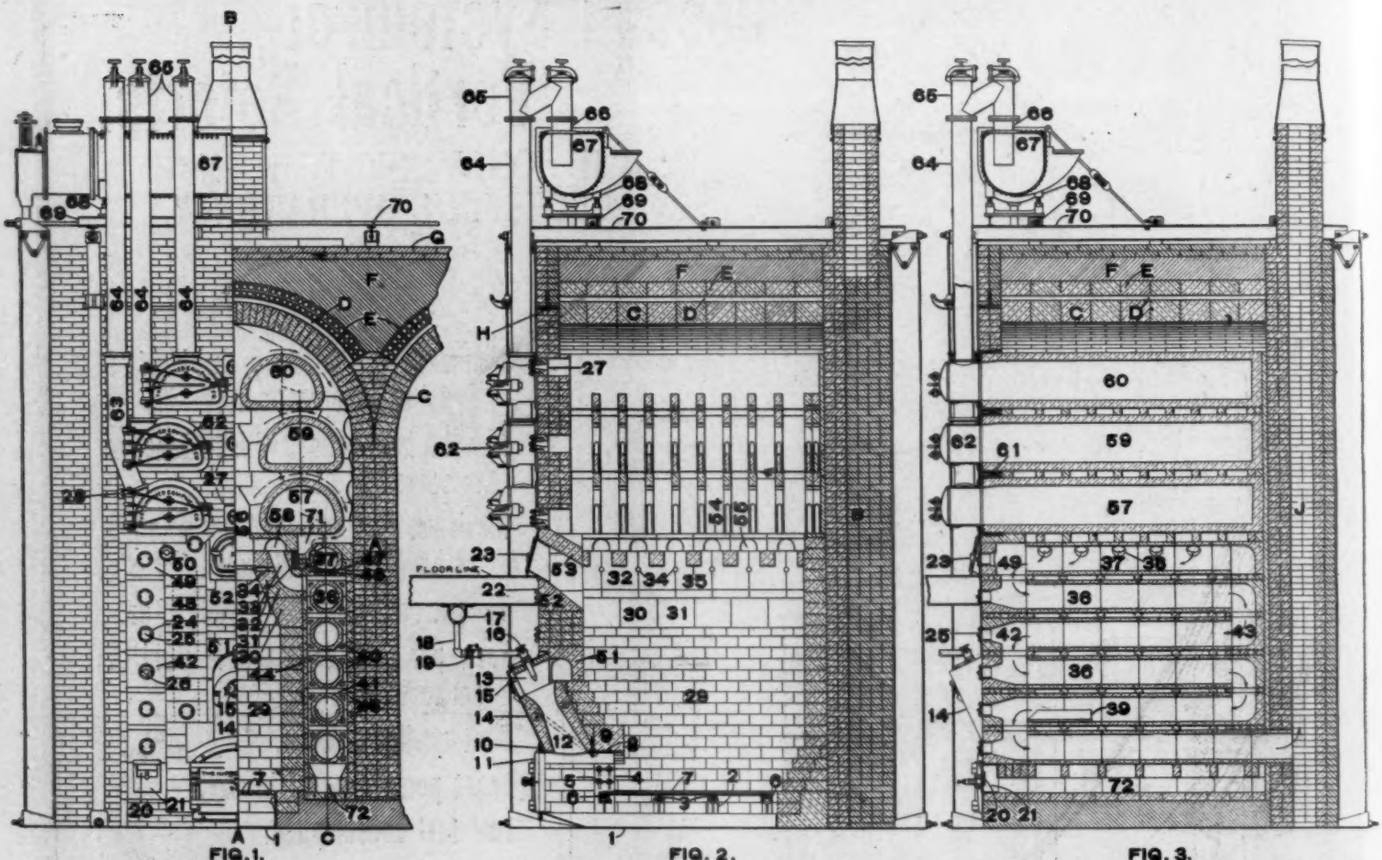

FIG. 1. HALF FRONT SECTIONAL ELEVATION

FIG. 2. SECTIONAL SIDE ELEVATION ON A-B

FIG. 3. SECTIONAL SIDE ELEVATION ON C-B

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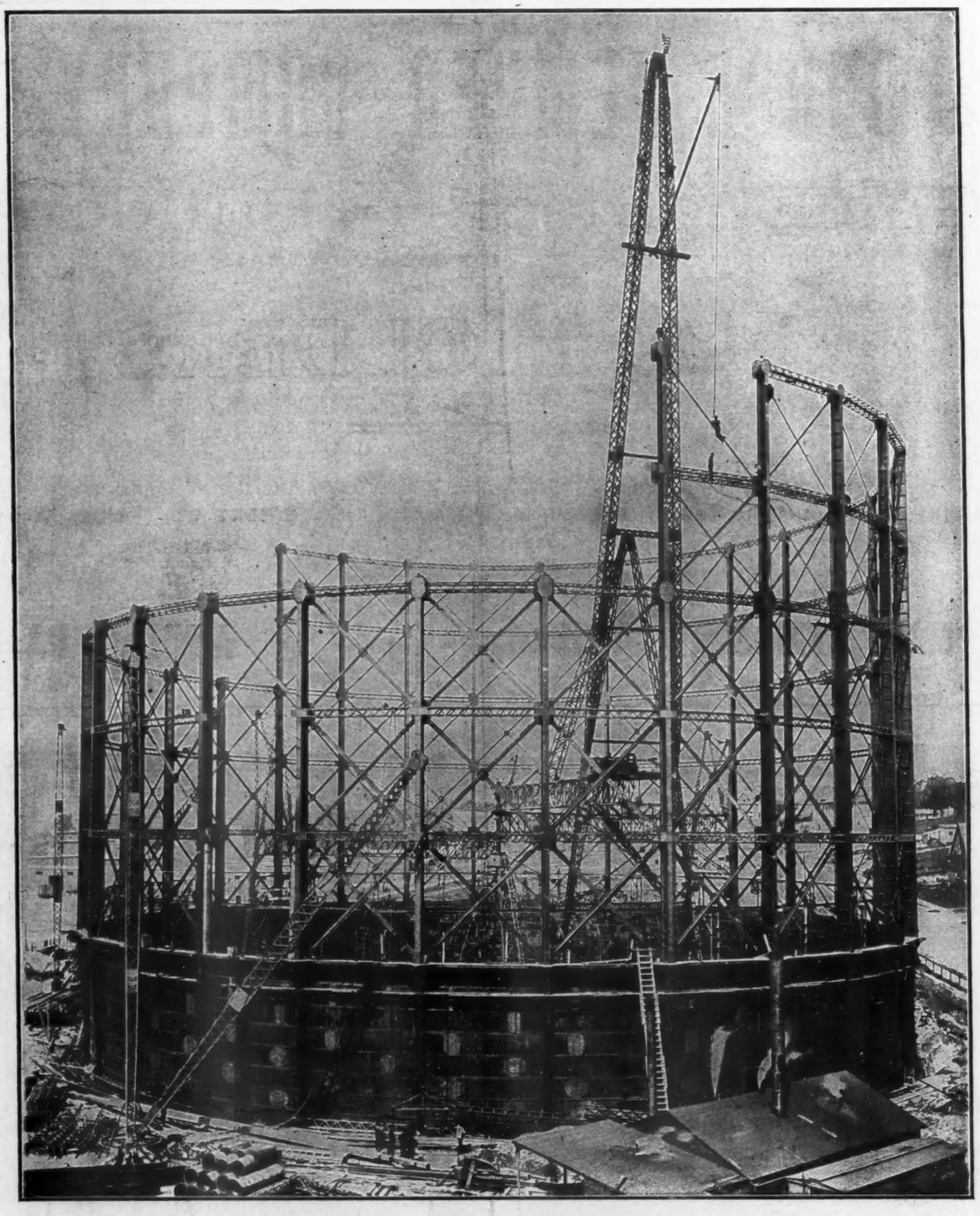

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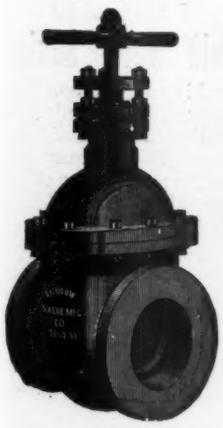

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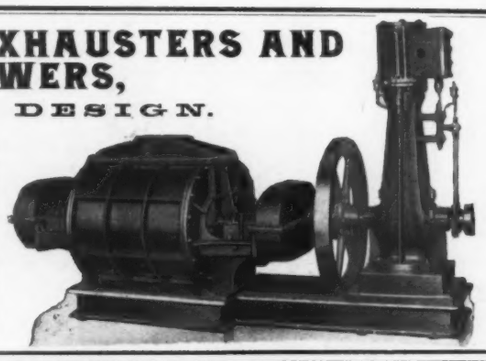

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"LACLEDE-CHRISTY."

BEST DESIGN,
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COAL TAR AND AMMONIA,

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Humphrey Instantaneous Bath Water Heaters

Should be used in every home. They make Hot Water always ready. Require no attention after installation. Hot water pours forth at any time upon lighting the gas. Close off the gas and all expense ceases. Absolutely Guaranteed.

Special Merits.

A burner that won't light back; a rust proof enameled shelf; a removable base plate for ready access to burner.

Shall we Send Catalog No. 9 and Discounts?

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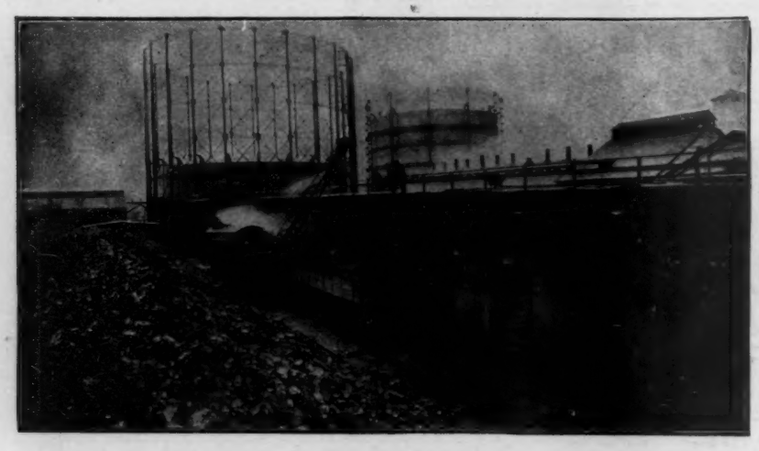

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THE BROWN HOISTING MACHINERY COMPANY,

Designers and Builders of All Kinds of Hoisting Machinery.

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SQUARE HEAD, Without Check.

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Mueller Gas Service Cocks.

Blue jeans could be made up to a dress suit pattern, but would be a dress suit in shape only.

Inferior metal can be molded to the pattern of first-class gas cocks, but will be first-class only in form--the quality is lacking.

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Bray's Special Burner.

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For Markets, Meat Shops, Fruit Stands, Show Windows, Street Lamps, and all places where high candle power is required.

These Burners Give a Large, Well-Shaped Flame.

They are Very Durable and Can be Depended Upon to Give Satisfactory Service for Years.

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Showing at a glance the Accounts of 113 Coal and Water Gas Companies, Itemized under

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Photometrical and Experimental Apparatus.

PUBLIC LIGHTING TABLE.

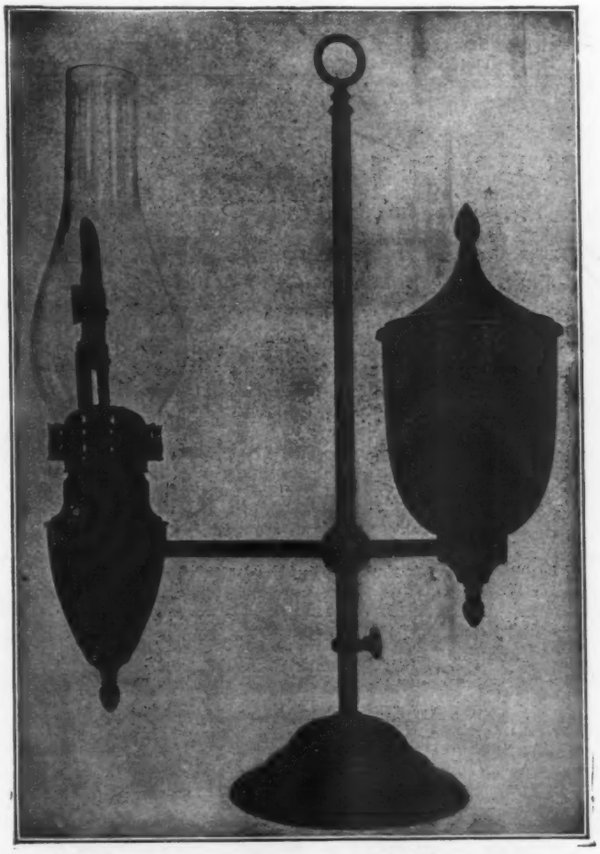
AUGUST, 1908.

Day of Week.	Date.	Table No. 1. FOLLOWING THE MOON. Light.	Extinguish.
Sat.	1	8.50 PM	4.00 AM
Sun.	2	9.10	4.00
Mon.	3	9.40	4.00
Tue.	4	10.00 FQ	4.00
Wed.	5	10.40	4.00
Thu.	6	11.10	4.00
Fri.	7	11 50	4.00
Sat.	8	12.50 AM	4.00
Sun.	9	1.50	4.10
Mon.	10	No L.	No L.
Tue.	11	No L FM	No L.
Wed.	12	No L.	No L.
Thu.	13	7.30 PM	9.20 PM
Fri.	14	7.30	10.00
Sat.	15	7.30	10.30
Sun.	16	7.20	11.00
Mon.	17	7.20	11.30
Tue.	18	7.20 LQ	12.00
Wed.	19	7.20	12.40 AM
Thu.	20	7.20	1.20
Fri.	21	7.20	2.10
Sat.	22	7.20	3.00
Sun.	23	7.10	4.20
Mon.	24	7.10	4.20
Tue.	25	7.10	4.20
Wed.	26	7.10 NM	4.20
Thu.	27	7.10	4.20
Fri.	28	7.10	4.20
Sat.	29	7.10	4.20
Sun.	30	7.10	4.30
Mon.	31	8.10	4.30

TOTAL HOURS DURING 1908.

By Table No. 1.

	Hrs.Min.
January	228.30
February	187.30
March	192.00
April	160.10
May	155.10
June	138.00
July	155.50
August	173.40
September	185.20
October	214.00
November	218.10
December	226.40
Total, yr.	2235.00



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10-Candle Power.

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This lamp is a perfect substitute for the 10-candle Pentane Lamp hitherto used, and has the following advantages:

1st. It uses Standard Kerosene Oil (Pratt's Astral Oil or equivalent).

2d. It is remarkably steady. Will burn 24 hours continuously with less than 2 per cent. variation.

3d. It is much less dangerous than Pentane, which is a kind of gasolene.

4th. It is not easily affected by air currents in the photometer room.

5th. Since the lamp may burn continuously, the candle power of gas may be taken at any moment, if necessary. This insures steady illuminating power without waste of carburetting material.

6th. The first cost of the lamp brings it within the reach of even small gas works.

7th. Costs much less to maintain than a Pentane lamp or sperm candles doing the same service.

8th. Is not affected by the weather.

PUBLIC LIGHTING TABLE.

AUGUST, 1908.

Day of Week.	Date.	Table No. 2. NEW YORK CITY. ALL NIGHT LIGHTING. Complete Lighting in One Hour	Complete Extinguishing in 50 Minutes
		From Time Given	
		P. M.	A.M.
Sat.	1	7.02	3.27
Sun.	2	7.02	3.27
Mon.	3	7.02	3.27
Tue.	4	7.02	3.27
Wed.	5	7 02	3.27
Thu.	6	6.57	3.37
Fri.	7	6.57	3.37
Sat.	8	6.57	3.37
Sun.	9	6.57	3.37
Mon.	10	6.57	3.37
Tue.	11	6.57	3.37
Wed.	12	6.57	3.37
Thu.	13	6 47	3.47
Fri.	14	6.47	3.47
Sat.	15	6.47	3.47
Sun.	16	6.47	3.47
Mon.	17	6.47	3.47
Tue.	18	6.47	3.47
Wed.	19	6.47	3.47
Thu.	20	6 37	3.52
Fri.	21	6 37	3.52
Sat.	22	6.37	3.52
Sun.	23	6.37	3.52
Mon.	24	6.37	3.52
Tue.	25	6.37	3.52
Wed.	26	6.37	3 52
Thu.	27	6.27	3.57
Fri.	28	6.27	3.57
Sat.	29	6.27	3.57
Sun.	30	6.27	3.57
Mon.	31	6.27	3.57

TOTAL HOURS DURING 1908.

	Hrs.Min.
January	481.50
February	329.15
March	351.50
April	341.50
May	233.05
June	218.10
July	282.55
August	254.55
September	292.25
October	420.45
November	374.30
December	411.05
	3992.35
Deduct on account of 50 min. extinguishing time	30.30
Total, yr.	3962.05

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....OF AMERICA....

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By means of the Welsbach System of street lighting the superiority of GAS over electricity for street lighting has been fully demonstrated.

POINTS OF MERIT:

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IT LIGHTS THE STREET.

Where there are no gas mains we can furnish an equally good light by our SELF-GENERATING NAPHTHA WELSBACH BURNER, and thereby supply a uniform light in all localities.

Correspondence Solicited from Gas Companies and Others interested in Municipal and Outside Lighting.

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The Chic Light.

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For decorative appearance and large volume of light at a popular price to the consumer,

THE CHIC LIGHT

is practically alone in the field. Complete satisfaction to the user is its strong point.

THE CHIC LIGHT—Design No. 71310.

PRICES:

Boxed complete, with No. 71 Welsbach burner, No. 310 F. Q. M. cylinder, No. 196 Junior J Brand Welsbach mantle, including the No. 316 opal shade, which will be packed separately.

Price, complete, clear cylinder, each, dozen lots, ... $1.35
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Package Contains 16 Dozen.

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Coney Island, N. Y.
Mexico, Mo.
Jacksonville, Fla.
Syracuse, N. Y. (2d contract).
Atlanta, Ga. (2d contract).
Holyoke, Mass.
Peoria, Ills.
Schenectady, N. Y. (2d contract).
Danbury, Conn.
Galveston, Tex. (2d contract).
Quebec, Canada.
Indianapolis, Ind. (2d contract).
Bessemer, Ala.
Waterbury, Conn. (5th contract).
Sioux Falls, S. D. (3d contract).
Philadelphia, Pa.
New Hartford, Conn.
Poughkeepsie, N.Y. (2d contract).
Nashville, Tenn.
Salisbury, Md.
Norfolk, Va. (4th contract).
Wallingford, Conn.
Richmond, Va. (2d contract).
Oak Bluffs, Mass.
Arlington, Mass.

TOTAL SETS INSTALLED DURING YEAR, ... 43
TOTAL SETS INSTALLED TO DECEMBER 31, 1907, ... 677
TOTAL DAILY CAPACITY, TO DECEMBER 31, 1907, ... 545,865,000 cu. ft.

Tar Extractors for Carburetted Water Gas.
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Straight Standpipe System for Coal Gas Retorts.
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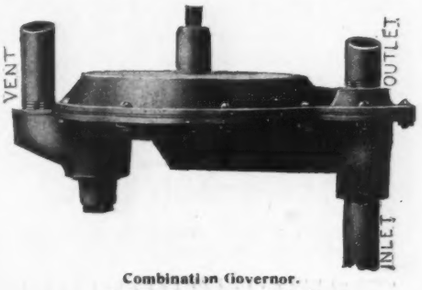

Combination Governor.
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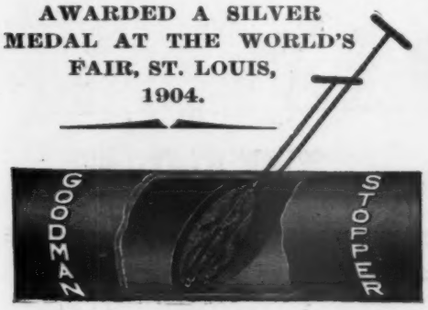

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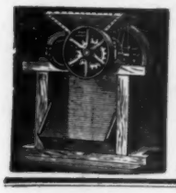

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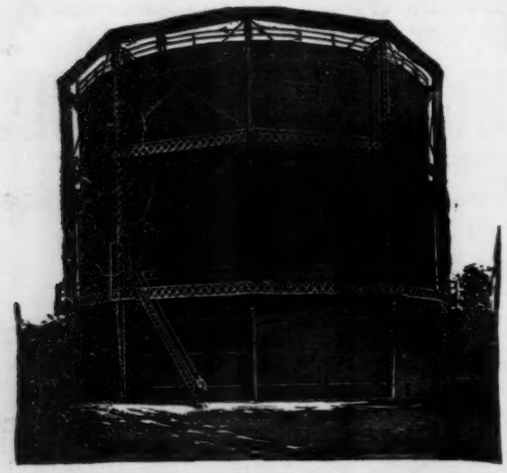

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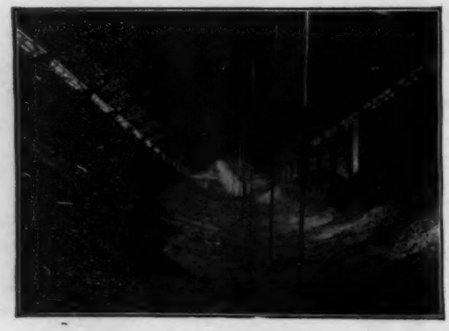

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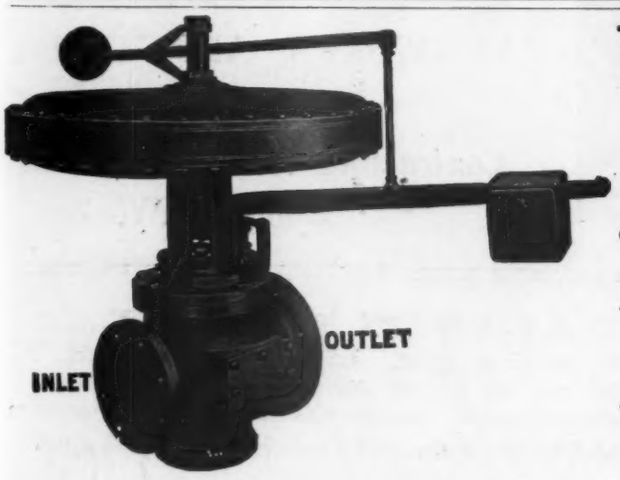

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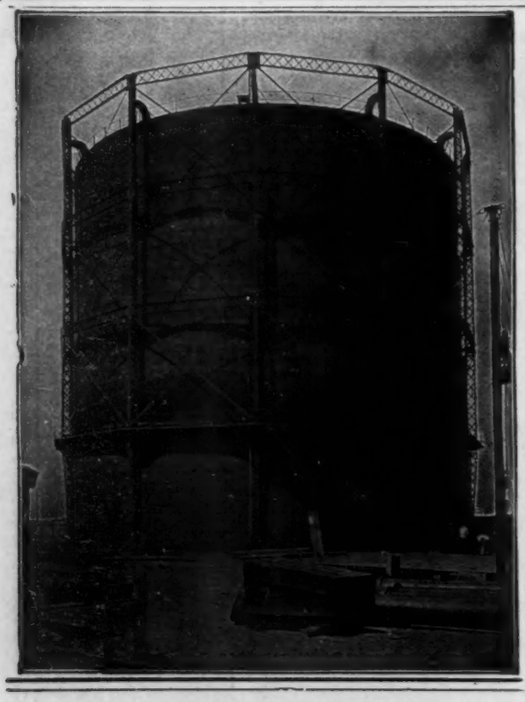

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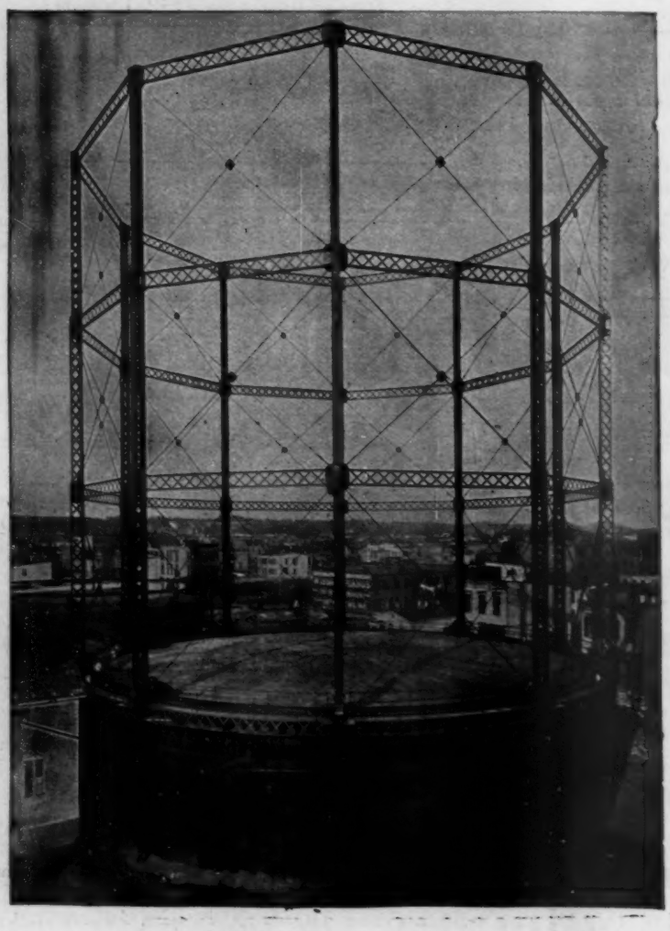

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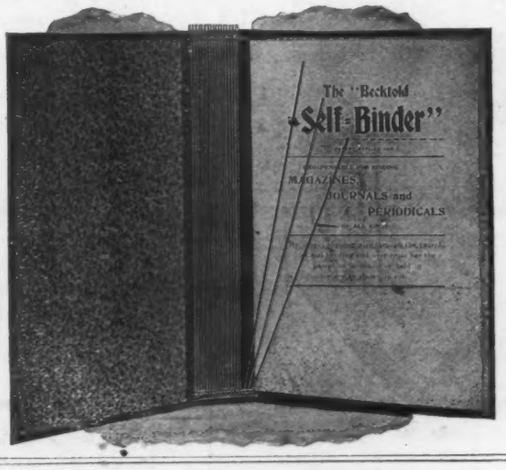

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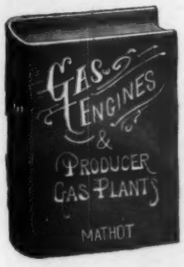

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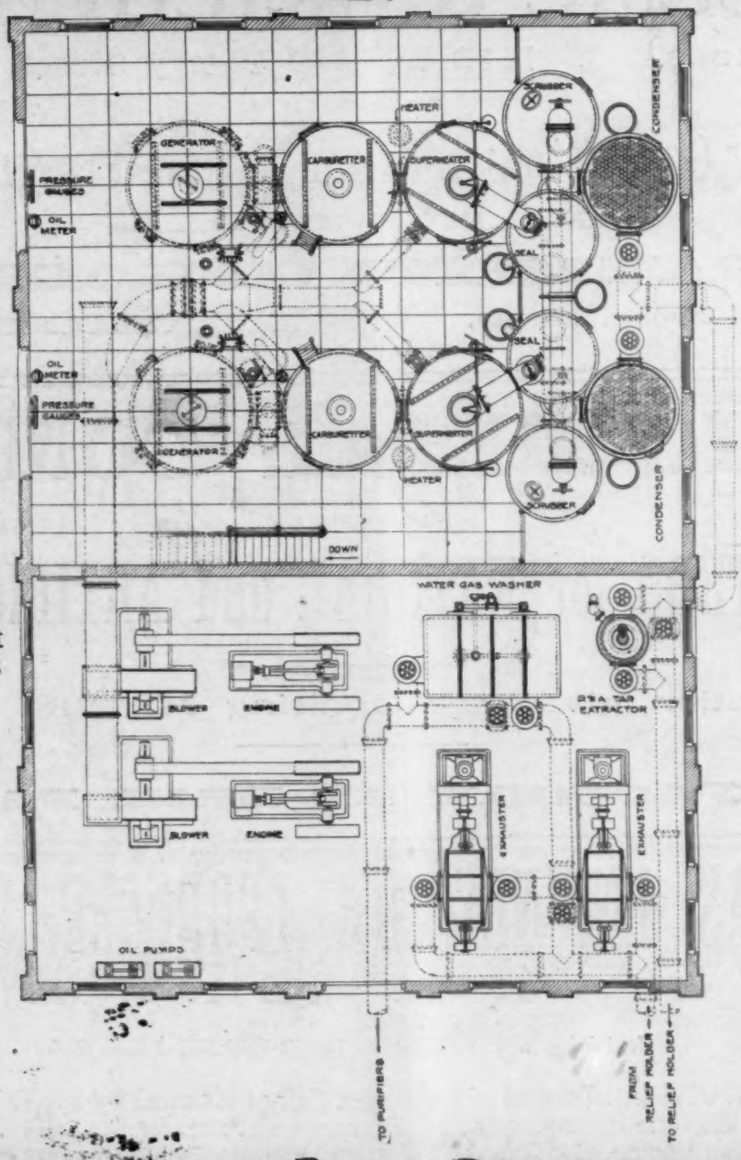

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